

JFLEX-Multimedia

Product Manual

Document Revision 1.2



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1. USER INFORMATION

1.1 About This Manual

This document provides information about products from Kontron Embedded Computers AG and/or its subsidiaries. No warranty of suitability, purpose, or fitness is implied.
While every attempt has been made to ensure that the information in this document is accurate, the information contained within is supplied “as-is” and is subject to change without notice.
For the circuits, descriptions and tables indicated, Kontron assumes no responsibility as

1.2 JUMPtec Brand

JUM*Ptec* Industrielle Computertechnik AG and Kontron Embedded Computers AG merged in July 2002. JUM*Ptec* is now known as Kontron Embedded Modules GmbH.
Products labeled and sold under the Kontron Embedded Modules name (formerly JUM*Pte*c) are now considered Kontron products for all practical purposes, including warranty and support.
DIMM-PC®, PISA®, ETX Components SBC, JUMPtec®, and Kontron Embedded Modules are registered trademarks of Kontron Embedded Modules GmbH.

1.3 Copyright Notice

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1.4 Trademarks

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- IBM, XT, AT, PS/2 and Personal System/2 are trademarks of International Business Machines Corp.

- Microsoft is a registered trademark of Microsoft Corp.

- All other products and trademarks mentioned in this manual are trademarks of their respective owners.

1.5 Standards

Kontron Embedded Modules is certified to ISO 9000 standards.

1.6 Warranty

This Kontron Embedded Modules product is warranted against defects in material and workmanship for the warranty period from the date of shipment. During the warranty period, Kontron Embedded Modules will at its discretion decide to repair or replace defective products.
Within the warranty period, the repair of products is free of charge as long as warranty conditions are observed.
You may receive a bill for test costs if Kontron Embedded Modules finds no fault with the product. You also may receive a bill for repairs if a product's warranty has expired.
For warranty service or repair, return the product to a Kontron Embedded Modules service facility listed in the Technical Support section of this document.
The warranty does not apply to defects resulting from improper or inadequate maintenance or handling by the buyer, unauthorized modification or misuse, operation outside of the product's environmental specifications or improper installation or maintenance.
Kontron Embedded Modules will not be responsible for any defects or damages to other products not supplied by Kontron Embedded Modules that are caused by a faulty Kontron Embedded Modules product.

1.7 Technical Support

Technicians and engineers from Kontron Embedded Modules and/or its subsidiaries are available for technical support. We are committed to making our product easy to use and will help you use our products in your systems. Before contacting Kontron Embedded Modules technical support, please consult our **Web site** for the latest product documentation, utilities, and drivers. If the information does not help solve the problem, contact us by email or telephone. The table below lists technical support contacts and service facilities for Kontron Embedded Modules.

Asia	Europe	North/South America
Kontron Asia	**Kontron Embedded Modules**	**Kontron Americas**
5F-1, 341, Sec 4 Chung Hsiao E. Road Taipei, Taiwan	Brunnwiesenstr. 16 94469 Deggendorf – Germany	3988 Trust Way Hayward, CA 94545
Tel: +886 2 2751 7192	Tel: +49 (0) 991-37024-0	Tel:510-732-6900
Fax: +886 2 2772 0314	Fax: +49 (0) 991-37024-104	Fax: 510-732-7655
http://www.jumptec.com.tw/ http://www.kontron.com.tw/	http://www.jumptec.de/ http://www.kontron.de/	http://www.adastra.com/ http://www.kontron.com/
		techsupport@jumptec.com

2. INTRODUCTION

2.1 JFLEX-Multimedia

The JFLEX-Multimedia is an extension for Kontrons JRex 3,5'' SBC family.

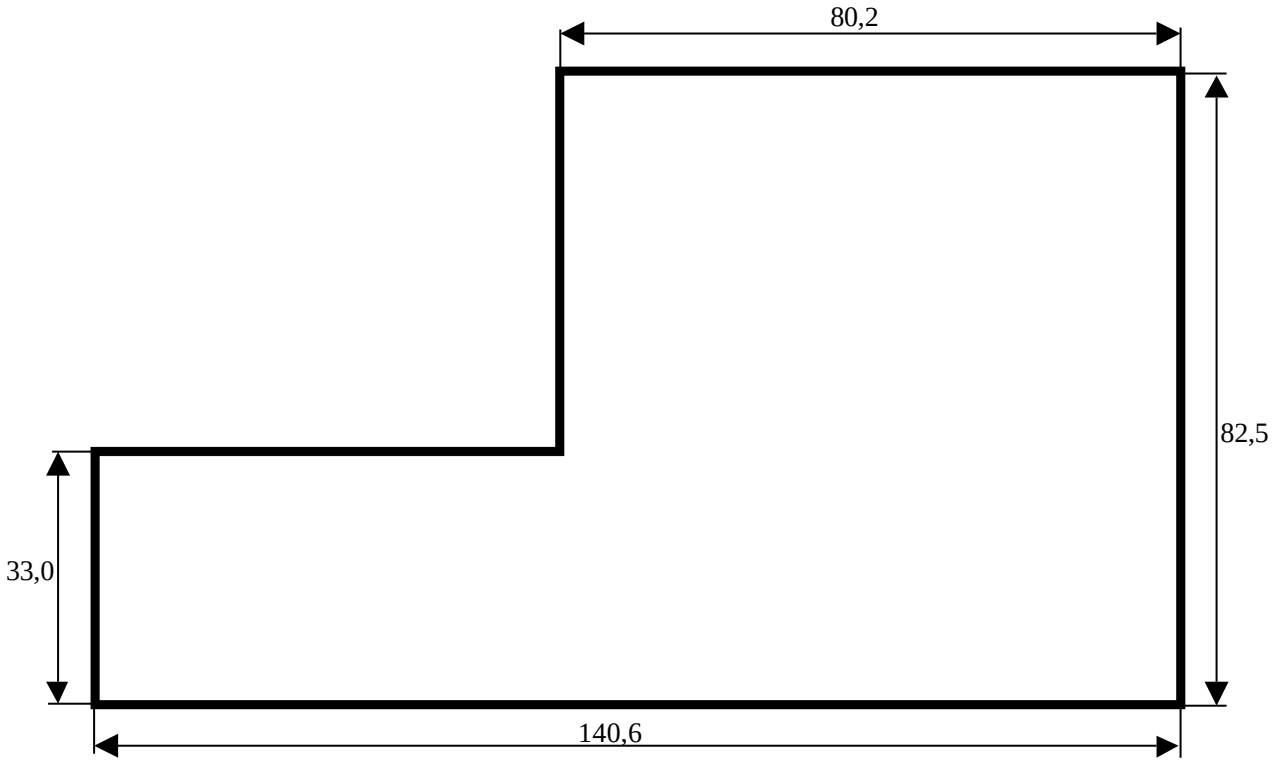
Following features are provided by the JFLEX-Multimedia:

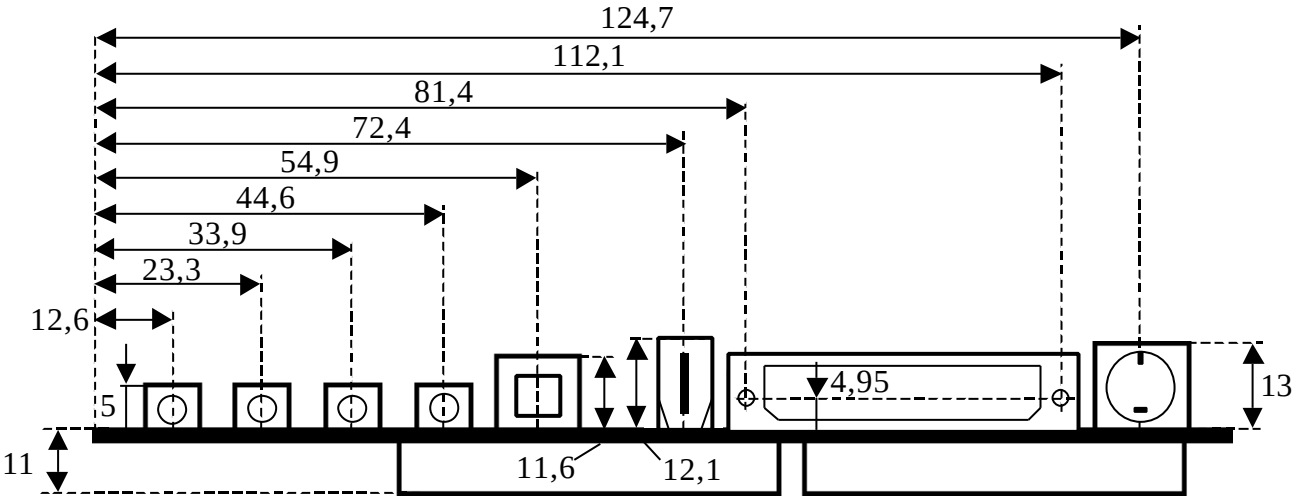
- One Realtek ALC650 sound controller compatible to Intel® Audio Codec ´97 Rev. 2.2
  Input connectors: Microphone, Line, CD-ROM (internal)
  Output connectors: Line, Amp (6W/channel @ 4Ω, S/PDIF (optical)
- 3,3V switching regulator to run the JRex system on 5V only
- IEEE1394 (Firewire) controller
- DVI digital
- TV-Out through S-Video connector
- IrDA Connector

3. SPECIFICATIONS

3.1 Mechanical Specifications

- Mechanical: 140,6mm x 82,5mm L-shape





All dimensions are given in Millimeters [mm].

3.2 ElectricalSpecifications

3.2.1 Supply Voltage for Sound

- 5V DC +/- 5%
- 3,3V DC +/- 5%

3.2.2 Supply Voltage Ripple

- 100 mV peak to peak 0-20 MHz

3.2.3 Supply Current

- @ 3.3V max. 750mA
- @ 5V max. 200mA
- @ 12V max. 100mA (excluding Firewire device)

3.2.4 Output Voltage

- 3,3V DC +/- 5% max 3,5A

3.3 EnvironmentalSpecifications

3.3.1 Temperature

- Operating: 0 to + 60°C
- Storage: -10 to + 85 ° C

3.3.2 Humidity

- Operating: 10% to 90% (non condensing)
- Storage: 5% to 95% (non condensing)

To protect the external powerlines to peripheral devices the customer has to take care about:

- The wires to the external device have the right diameter to withstand the max. available current.
- The housing of the external device fulfills the fire protectingrequirements of IEC/EN 60950.

4. MODULE FUNCTIONS

4.1 AC '97 Sound Controller

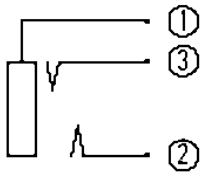
The JFLEX-Multimedia uses a Realtek ALC650 sound codec. The ALC650 is an 18-bit, full duplex AC'97 2.2 compatible stereo audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR based designs. The ALC650 incorporates proprietary converter technology to achieve a high SNR, greater than 90 dB.
The ALC650 also supports an AC'97 2.2 compliant S/PDIF out function which allows easy connection from the PC to consumer electronic products, such as AC3 decoder/speaker and mini disk.

All major operating systems support the interface.

The ALC650 provides:

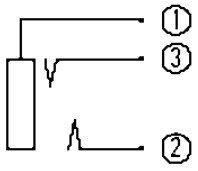
- High performance CODEC with high S/N ratio (>90 dB)
- 18-bit ADC and 20-bit DAC resolution
- Compliant with AC'97 2.2 specifications
- 18-bit stereo full-duplex CODEC with independent and variable sampling rate
- 1 analog line-level stereo input with 5-bit volume control: LINE_IN, (CD_IN is possible)
- Stereo output with 5-bit volume control
- 1 MIC input
- Power management capabilities
- Embedded 50mW/20ohm OP at front LINE output
- Digital S/PDIF output

4.1.1 Line-In Connector X8



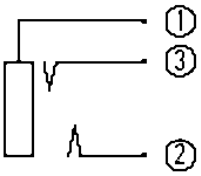
Pin	Signalname
1	GND
2	L_IN Left
3	L_IN Right

4.1.2 Line-Out Connector X11



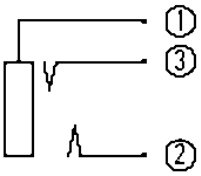
Pin	Signalname
1	GND
2	L_OUT Left
3	L_OUT Right

4.1.3 Microphone-IN Connector X9



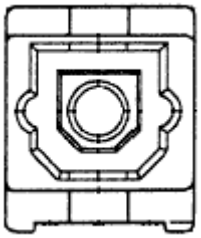
Pin	Signalname
1	GND
2	MIC_IN Left
3	not connected

4.1.4 Amplified-OUT Connector X10



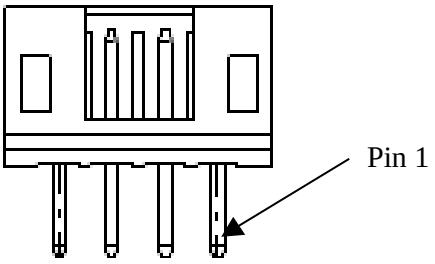
Pin	Signalname
1	GND
2	AMP_Out Left
3	AMP_Out Right

4.1.5 S/PDIF-OUT Connector X12



Fiber Output Power	-21 ... –15 dBm
Wavelength	660 nm

4.1.6 CD-ROM Input X7



Pin	Signalname	Function
1	CD_IN Right	Audio Input Right Channel
2	NC	
3	CD_IN Left	Audio Input Left Channel
4	GND	Signal Ground

4.2 TV-out

The JFLEX-Multimedia provides FBAS and S-Video output signals for interfacing certain displays or beamers for example.

4.2.1 S-Video Connector X13



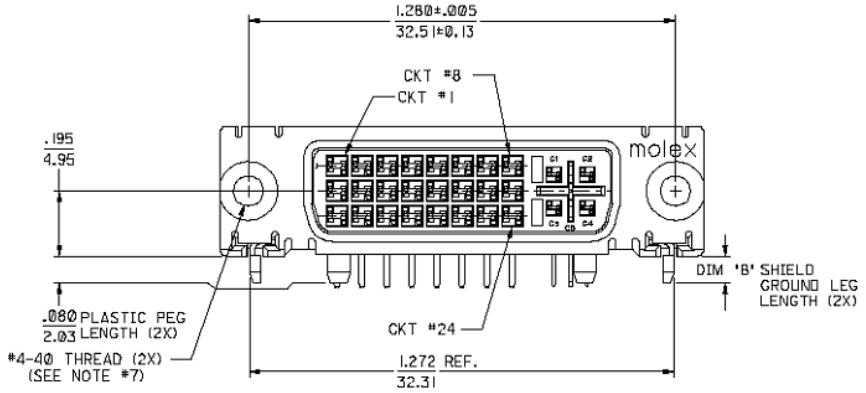
Pin	Name	Description
1	GND	Ground (Y)
2	GND	Ground (C)
3	Y	Intensity (Luminance) / Composite
4	C	Color (Chrominance)

4.3 DVI (Digital Video Interface)

The JFLEX-Multimedia is equipped with a standard Digital Video Interface. DVI has the potential to unify the digital display industry. The DVI 1.0 specification was endorsed in April 1999 by the Digital Display Working Group (DDWG), an industry organization established by Intel. Membership consists of major PC and display manufacturers. TI is a DDWG participant.

DVI is based on Transition-Minimized Differential Signaling (T.M.D.S.), a technology that offers advantages in video data transmission. DVI adds a specific hardware interface that is compatible with older T.M.D.S.-based interfaces such as the Plug & Display (P&D) and Digital Flat Panel (DFP) standards endorsed by the Video Electronics Standards Association (VESA). DVI technology is non-proprietary to encourage the most widespread adoption.

4.3.1 DVI Connector



Pin	Signal	Pin	Signal	Pin	Signal
1	T.M.D.S. Data 2-	9	T.M.D.S. Data 1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data 2+	10	T.M.D.S. Data 1+	18	T.M.D.S. Data0+
3	GND	11	GND	19	GND
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDC Clock	14	+ 5V Power	22	GND
7	DDC Data	15	GND	23	T.M.D.S. Clock+
8	NC	16	Hot Plug Detect	24	T.M.D.S. Clock-
C1	NC	C2	NC	C3	NC
C4	NC	C5	GND		

4.4 IEEE 1394 Controller

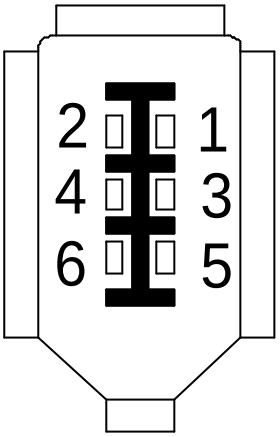
The JFLEX-Communication1 IEEE 1394 interface use VIA VT6306 PCI Host Controller. This is a 1394A OHCI Host Controller with integrated 3-PORT 400 MBIT PHY.

The VT6306 provides:

- 32 bit CRC generator and checker for receive and transmit data
- On-chip isochronous receive and transmit FIFOs for packets
- 8 isochronous transmit / receive contexts
- 2-deep physical response queue
- 3-deep physical post-write queue
- Dual buffer mode enhancements
- Skip Processing enhancements
- Block Read Request handling
- Ack_tardy processing
- Compliant with 1394 Open HCI Specifications v1.0 and v1.1
- Descriptor based isochronous and asynchronous DMA channels for receive / transmit packets
- Compliant with PCI specification v2.2
- Supports I2C EEPROM and 4-Wire Serial ROM with GUID PROM Shadow to EEPROM

4.4.1 Connector (X5)

6 PIN IEEE1394 female connector



4.4.2 Connector Pinout

Pin	Signal Name	Function	In/Out
1	Power	12V DC	Output
2	Ground	Ground return for power and inner cable shield	
3	TPB-	Twisted-pair B, differential signals	Differential Output
4	TPB+	Twisted-pair B, differential signals	Differential Output
5	TPA-	Twisted-pair A, differential signals	Differential Output
6	TPA+	Twisted-pair A, differential signals	Differential Output

Note: The current of the power lines is internal limited to 1500mA

4.4.3 IEEE Technical Support

For technical support, contact either **Kontron Embedded Modules** or get support information from http://www.via.com.tw/en/Communications/prodviafire2.jsp.

4.5 IrDA-Connector X15

IRDA (named after the standardizing group " InfraRed Data Association") defines a standard for high speed infrared data transfer (over distances of about 1 meter).

For the infrared feature to be available, you must connect an infrared module to the IrDA connector and configure the infrared settings in BIOS setup. The IrDA connector supports the optional wireless transmitting and receiving infrared module.

The connector with eight positions used on JFLEX-Multimedia for connecting an infrared module is from manufacturer BERG and the corresponding counterpart is specified as following:

Manufacturer: BERG Electronics
Type: DUBOX system, Housing, single row, 2,54mm
Order number: 65240-008

Fitting crimp contacts:
Manufacturer: BERG Electronics
Type: DUBOX system, Contact crimp to wire, 2,54mm
Order number: 76357-301 (Wire size 22-30, Insulation O.D. 0,9-1,5, Loose piece contacts)

Pin	Signalname	Function
1	NC	
2	NC	
3	IRTX	Infrared transmit
4	GND	Ground
5	IRRX	Infrared receive
6	VCC	+5V
7	NC	
8	NC	

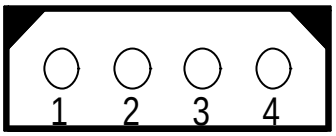
4.6 Power

If a not self powered Firewire (1394) device is connected it is strictly recommended to use this power connector for additional power supply.

Otherwise the JFLEX-Multimedia or the JRex board can get permanently damaged.

4.6.1 Connector (X6)

Pin	Pin Function
1	+5V DC
2	GND
3	GND
4	+12V DC



4.6.2 3,3V DC-DC Switching Regulator

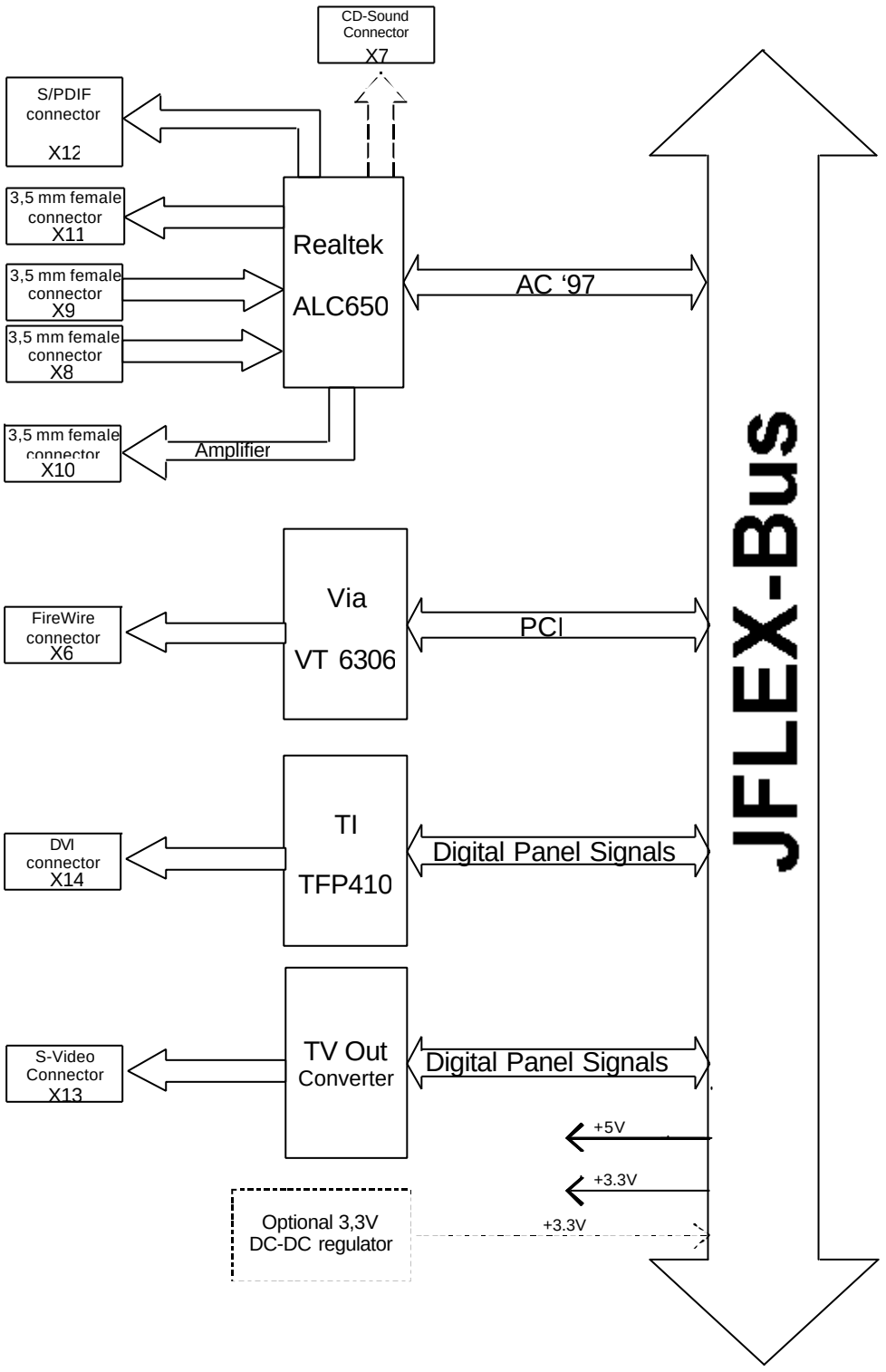
When operating the JRex CPU board with a 5V-only Power supply the JFLEX-Multimedia with assembled 3,3V option can be used to generate the desired 3,3V for the CPU board.

This is done with a LM2636 Switching regulator. The maximum current is 2,5 A.

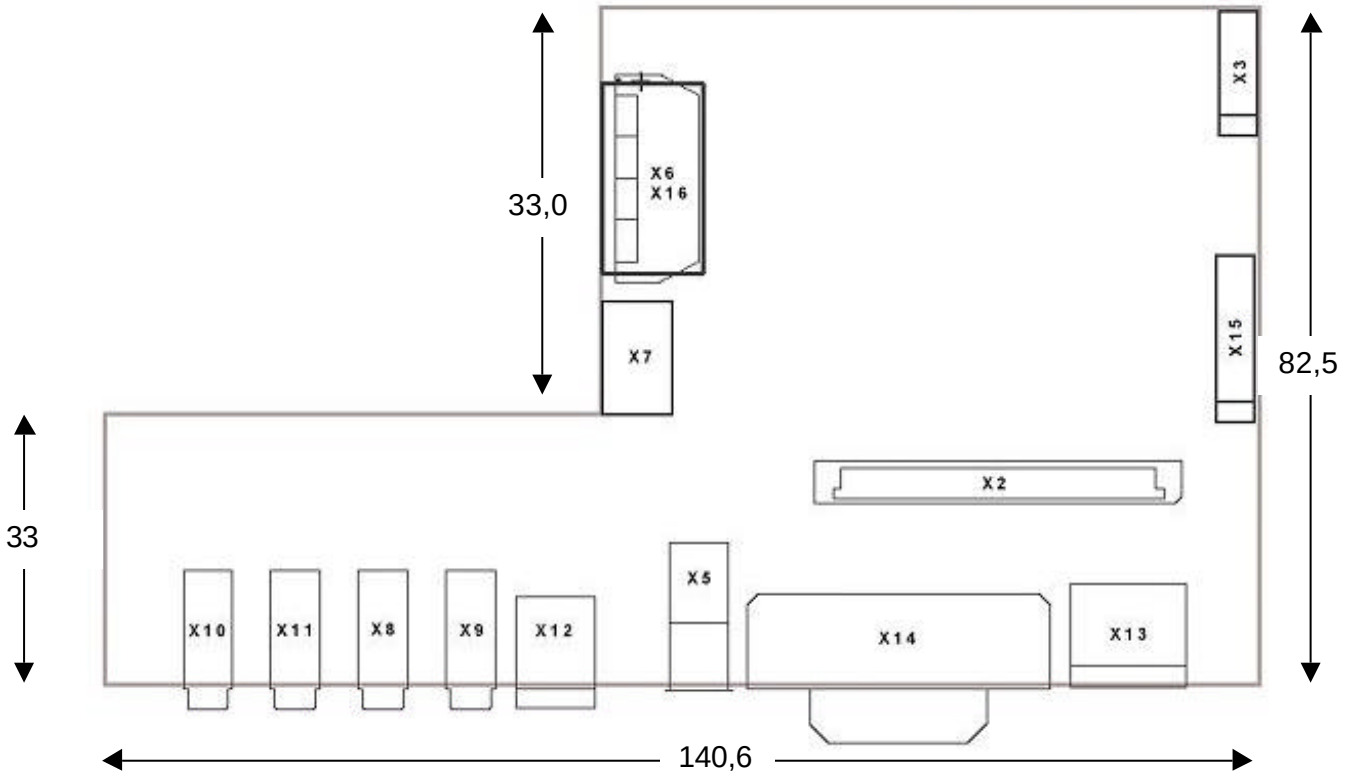
Attention: Most current from 3,3V is drawn by the SDRAM module. The user has to make sure when selecting a SDRAM module not to exceed the maximum current.

Attention: Do not connect an ATX power supply with 3,3V output, when JFLEX-Multimedia with mounted 3,3V regulator is connected. The 3,3V source will get permanently damaged !

5. APPENDIX A: BLOCK DIAGRAM



6. APPENDIX B: MECHANICAL DIMENSIONS AND CONNECTOR LAYOUT



All dimensions are given in Millimeters [mm].

7. APPENDIX C: LITERATURE AND STANDARDS

Below is a list of information sources to help you to further understand PC architecture.

7.1 Buses and General PC Architetcure

7.1.1 PCI

PCI spec. @ http://www.pcisig.com/home/

- The PCI-SIG provides a forum for its ~900 member companies, who develop PCI products based on the specifications that are created by the PCI-SIG.
- *PCI & PCI-X Hardware and Software Architecture & Design*, Fifth Edition, Edward Solari and George Willse, Annabooks, 2001, ISBN 0-929392-63-9.
- *PCI System Architecture,* Tom Shanley and Don Anderson, Addison-Wesley, 2000, ISBN 0-201-30974-2.

7.1.2 USB

USB spec. @ http://www.usb.org/

USB Implementers Forum, Inc. is a non-profit corporation founded by the group of companies that developed the Universal Serial Bus specification. The USB-IF was formed to provide a support organization and forum for the advancement and adoption of Universal Serial Bus technology.

7.1.3 AC '97

AC '97 spec. @ http://www.intel.com/labs/media/audio/

The specification defines the Audio Codec '97 (AC '97) Architecture and Digital Interface (AC-link) specifically designed for implementing audio and modem I/O functionality in PC systems. This specification does not explicitly define the companion AC '97 Digital Controller component (sometimes referred to or

abbreviated as DC '97), which typically varies in features and implementation, but is AC '97 compliant with this specification.

7.1.4 IEEE 1394 - FireWire

IEEE1394 spec. @ http://developer.intel.com/technology/1394/specs.htm

This is the latest 1394 Open Host Controller (OHCI) Specification approved by the OHCI Working Group Promoters. The 1394 OHCI Specification is an implementation of the link layer of the 1394 serial bus, with additional features to support the transaction and bus management layers.

IEEE 1394 (and the 1394 Open HCI) supports two types of data transfer: asynchronous and isochronous. Asynchronous data transfer puts the emphasis on guaranteed delivery of data, with less emphasis on guaranteed timing. Isochronous data transfer is the opposite, with the emphasis on the guaranteed timing of the data, and less emphasis on delivery.

7.1.5 DVI

DVI spec. @ http://www.ddwg.org/

The Digital Visual Interface (DVI) specification provides a high-speed digital connection for visual data types that is display technology independent. The interface is primarily focused at providing a connection between a computer and its display device. The DVI specification meets the needs of all segments of the PC industry (workstation, desktop, laptop, etc.) and will enable these different segments to unite around one monitor interface specification.

8. APPENDIX D: DOCUMENT REVISION HISTORY

Version	Date	Edited by	Changes
1.0	03.06.2003	BAJ	first public release
1.1	16.10.2003	BAJ	Corrected dimenstion error, added desc. of bus standards
1.2	19.11.2003	BAJ	added detailed connector-dimensioning