

JFLEX-Sound1

Product Manual

Document Revision 1.0

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1. USER INFORMATION

1.1 About This Manual

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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*Ptec*) are now considered Kontron products for all practical purposes, including warranty and support.
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- 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-Sound1

The JFLEX-Sound1 is an extension for Kontrons JRex 3,5'' SBC family.

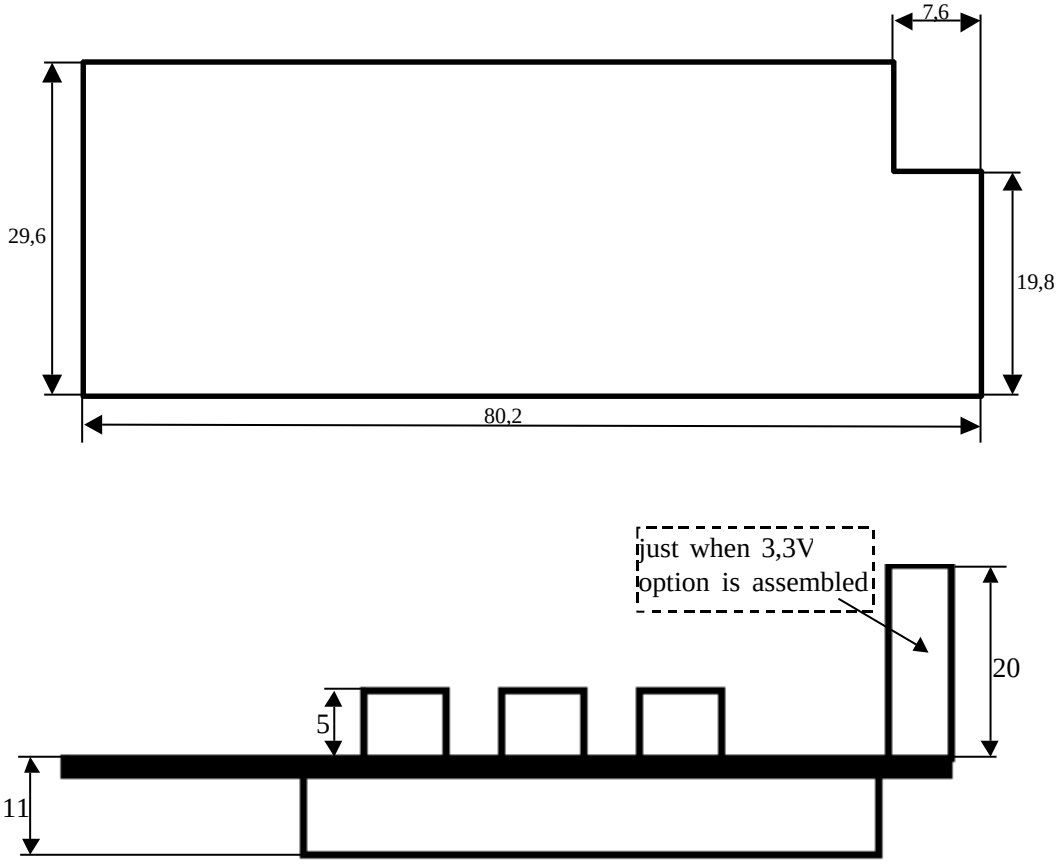
Following features are provided by the JFLEX-Sound1:

- One Realtek ALC650 sound controller compatible to Intel® Audio Codec ´97 Rev. 2.2
  Input connectors: Microphone, Line
  Output connectors: Line
- 3,3V linear regulator to run the the JRex system on 5V only

3. SPECIFICATIONS

3.1 MechanicalSpecifications

- Mechanical: 80,2mm x 29,6mm with 7,6 mm clearance on right side for easy exchanging IDE cable on JRex CPU board.



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 for Sound

- @ 5V max. 100mA
- @ 3.3V max. 50mA

3.2.4 Output Voltage

- 3,3V DC +/- 5%

3.2.5 Output Current for JRex Board

- max. 1,5A @ 3,3V

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

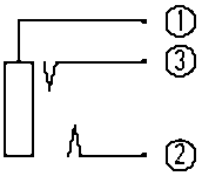
The JFLEX-Sound1 uses a Realtek ALC650 sound codec. The ALC650 is an 18-bit, full duplex AC'97 2.2 compatible stereo audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR based designs. The ALC650 incorporates proprietary converter technology to achieve a high SNR, greater than 90 dB.
The ALC650 also supports an AC'97 2.2 compliant SPDIF out function which allows easy connection from the PC to consumer electronic products, such as AC3 decoder/speaker and mini disk. This interface is available on another JFLEX extension board called JFLEX-Multimedia.

All major operating systems support the interface.

The ALC650 provides:

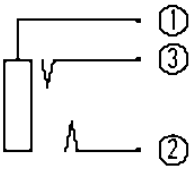
- High performance CODEC with high S/N ratio (>90 dB)
- 18-bit ADC and 20-bit DAC resolution
- Compliant with AC'97 2.2 specifications
- 18-bit stereo full-duplex CODEC with independent and variable sampling rate
- 1 analog line-level stereo input with 5-bit volume control: LINE_IN, (CD_IN is possible)
- 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 X5



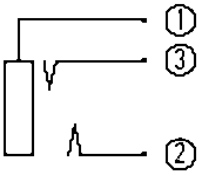
Pin	Signalname
1	GND
2	L_IN Left
3	L_IN Right

4.1.2 Line-Out Connector X4



Pin	Signalname
1	GND
2	L_OUT Left
3	L_OUT Right

4.1.3 Microphone-IN Connector X6



Pin	Signalname
1	GND
2	MIC_IN Left
3	not connected

4.2 3,3V Linear Regulator

When operating the JRex CPU board with a 5V-only Power supply the JFLEX-Sound1 with assembled 3,3V option can be used to generate the desired 3,3V for the CPU board.

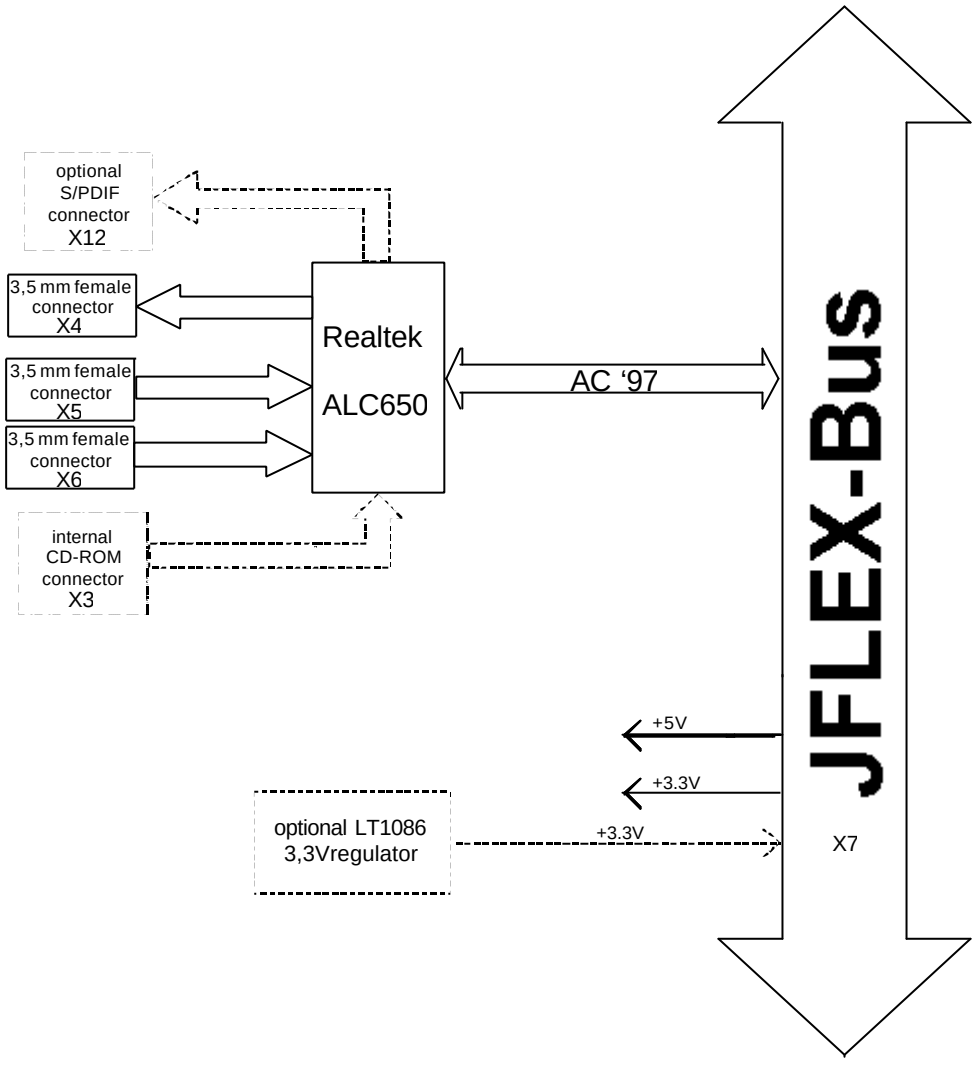
This is done with a LT1086 Linear regulator. The maximum current is 1,5 A. The snapped-on heatsink can be easily removed to connect the regulator to the system case for cooling.

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.

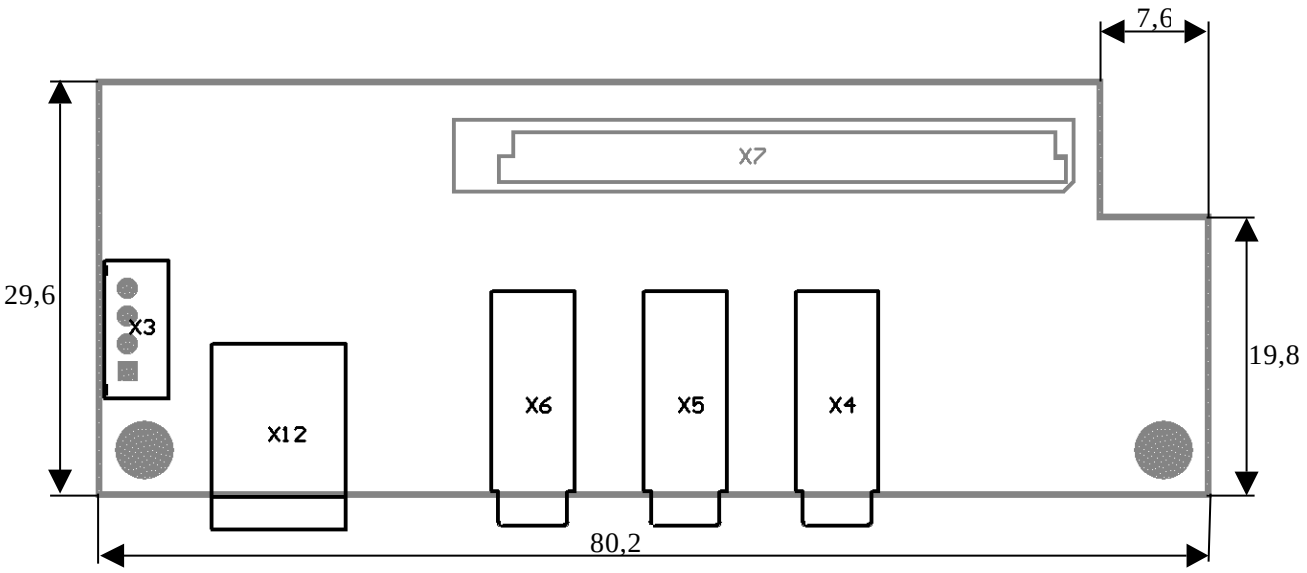
Examples:

JRex Board	used SDRAM	App. = DOS	App. = Memtest
JRex-P3	512MB (16 ICs)	1,2A @ 3,3V	!! 1,55A @ 3,3V
JRex-VE	512MB (16 ICs)	1,3A @ 3,3V	!! 1,6A @ 3,3V
JRex-GX1	512MB (16 ICs)	0,6A @ 3,3V	0,9A @ 3,3V
JRex-P3	256MB (8 ICs)	0,8A @ 3,3V	1,1A @ 3,3V
JRex-VE	256MB (8 ICs)	1,0A @ 3,3V	1,1A @ 3,3V
JRex-GX1	256MB (8 ICs)	0,5A @ 3,3V	0,6A @ 3,3V
JRex-P3	128MB (16 ICs)	1,0A @ 3,3V	1,2A @ 3,3V
JRex-VE	128MB (16 ICs)	1,0A @ 3,3V	1,2A @ 3,3V
JRex-GX1	128MB (16 ICs)	0,4A @ 3,3V	0,6A @ 3,3V
JRex-P3	128MB (8 ICs)	0,8A @ 3,3V	1,1A @ 3,3V
JRex-VE	128MB (8 ICs)	0,9A @ 3,3V	1,1A @ 3,3V
JRex-GX1	128MB (8 ICs)	0,35A @ 3,3V	0,60A @ 3,3V
JRex-VE	64MB (16 ICs)	1,4A @ 3,3V	1,5A @ 3,3V

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 SIG**
  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 specification
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 specification
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.

8. APPENDIX D: DOCUMENT REVISION HISTORY

Version	Date	Edited by	Changes
0.1	29.01.2003	BAJ	preliminary manual created
0.2	19.02.2003	BAJ	added 3,3V regulator part
1.0	05.06.2003	BAJ	first public release