



TRESOR

Datasheet

31/10/2017



VERSION V1.1

Summary

.1	REVISION HISTORY				
.2	2 Introduction				
.3	3 Description				
.4	.4 ABSOLUTE MAXIMUM RATING				
.5	.5 OPERATING CONDITION				
.6	6 Connectors and interfaces				
.6	.1	LS – Low Speed connector fully compliant to 96Boards specification	4		
.6	.6.2 HS – High Speed connector fully compliant to 96Boards specification		4		
.6	.6.3 Micro-USB Connector				
.7	Schematics				
.8	MECHANICAL DIMENSION				
.9	Notes				

.1 REVISION HISTORY

Date	Revision	Description
13/09/2017	V1.0	Draft version
31/10/2017	V1.1	Reviewed by FAE Technology, 3D models updated

.2 INTRODUCTION

Board was manufactured by FAE Technology commissioned by Arrow Electronics.

.3 DESCRIPTION

The TRESOR Mezzanine Board is a solution that enables the 96Boards to implement different security elements in the projects. The Board consists of three key components. The SLB9670x provides Trusted Platform Module (TPM) 2.0 functionality through SPI communication on the standard 96Boards LS expansion connector. For more compatibility the board contains the SLB9645x chip as well for supporting the TPM 1.2 Standard through I2C communication on the standard 96Boards LS expansion connector. The third secure element is the SLS32AIA020A TRUST-E authentication chip, sharing the same I2C bus with the TPM 1.2 module. This authentication functionality is mainly dedicated to the 96Boards IoT Edition platforms.

In addition the board is equipped with an UART to USB conversion chip which makes the debugging possible through a standard usb->micro_usb cable.

.4 ABSOLUTE MAXIMUM RATING

	min	max	unit
Supply voltage ¹	-0.3	20	V
Storage Temperature	-40	85	°C

1. Supply voltage is supported by the host board through the LS expansion connector. The voltage should not differ from 5V.

.5 OPERATING CONDITION

	min	typ	max	unit
Supply Voltage	2.7	5	18	V
Operating temperature	0		70	°C
TPM 1.2 Module				
SCL frequency Stand. Mode			100	kHz
SCL frequency Fast Mode			400	kHz
Default I2C address		0x20		HEX
TRUST E/X Module				
SCL frequency Fast Mode			400	kHz
Default I2C address		0x30		HEX
TPM 2.0 Module				
SPI SCLK frequency @VDD=1.8V			22.5	MHz
SPI SCLK frequency @VDD=3.3V			43	MHz
EPROM				
SCL frequency Stand. Mode			100	ku-
@VDD=1.72.5V			100	КПД
SCL frequency Fast Mode			400	247
@VDD=2.55.5V			400	KΠZ
I2C address set by HW		0x55		HEX

.6 CONNECTORS AND INTERFACES



.6.1 LS – Low Speed connector fully compliant to 96Boards specification

40 pin low profile female 2mm receptacle (20x2) 4.5mm height is specified

- UART0
- UART1 (optional)
- SPI bus
- I2C x2
- I2S
- GPIO x12
- Reset and Power button
- 1.8V, 5V and DC_IN power supplies

Pins used by the Mezzanine card:

UART0_CTS_N, UART0_TX, UART_RX, LS_EXP_GPIO_A, LS_EXP_GPIO_C, LS_EXP_GPIO_E, I2C0_SCL, I2C0_SDA, SPI0_CLK, SPI0_MISO, SPI0_CS_N, SPI0_MOSI, LS_EXP_GPIO_B, LS_EXP_GPIO_L

.6.2 HS – High Speed connector fully compliant to 96Boards specification

60 pin 0.8mm high speed Board to Board low profile receptacle connector is specified

- MIPI DSI
- USB
- SD or SPI interface
- MIPI CSI-2 (x2 optional)
- I 2 C (x2 optional, but 1 shall be provided if CSI interface(s) are provided)
- HSIC (optional)

All the pins of the HS expansion connector is available on the TRESOR Board.

.6.3 Micro-USB Connector

Debug interface for the Dragonboard, via UART0 to USB bridge. Default setting for the Serial communication is:

> Baud rate: **115200** Data: **8bit** Parity: **none** Stop: **1bit** Flow control: **none**





.8 MECHANICAL DIMENSION





Dimensions: L x W x H = 55.27mm x 43mm x 12.25mm

NOTES .9

ARROW ELECTRONICS

EVALUATION BOARD LICENSE AGREEMENT

By using this evaluation board or kit (together with all related software, firmware, components, and documentation provided by Arrow, "Evaluation Board"), You ("You") are agreeing to be bound by the terms and conditions of this Evaluation Board License Agreement ("Agreement"). Do not use the Evaluation Board until You have read and agreed to this Agreement. Your use of the Evaluation Board constitutes Your acceptance of this Agreement. PURPOSE

The purpose of this evaluation board is solely intended for evaluation purposes. Any use of the Board beyond these purposes is on your own risk. Furthermore, according the applicable law, the offering Arrow entity explicitly does not warrant, guarantee or provide any remedies to you with regard to the board. LICENSE

Arrow grants You a non-exclusive, limited right to use the enclosed Evaluation Board offering limited features only for Your evaluation and testing purposes in a research and development setting. Usage in a live environment is prohibited. The Evaluation Board shall not be, in any case, directly or indirectly assembled as a part in any production of Yours as it is solely developed to serve evaluation purposes and has no direct function and is not a finished product.

EVALUATION BOARD STATUS

The Evaluation Board offers limited features allowing You only to evaluate and test purposes. The Evaluation Board is not intended for consumer or household use. You are not authorized to use the Evaluation Board in any production system, and it may not be offered for sale or lease, or sold, leased or otherwise distributed for commercial purposes.

OWNERSHIP AND COPYRIGHT

Title to the Evaluation Board remains with Arrow and/or its licensors. This Agreement does not involve any transfer of intellectual property rights ("IPR) for evaluation board. You may not remove any copyright or other proprietary rights notices without prior written authorization from Arrow or it licensors.

RESTRICTIONS AND WARNINGS

Before You handle or use the Evaluation Board, You shall comply with all such warnings and other instructions and employ reasonable safety precautions in using the Evaluation Board. Failure to do so may result in death, personal injury, or property damage. You shall not use the Evaluation Board in any safety critical or functional safety testing, including but not limited to testing of life supporting, military or nuclear applications. Arrow expressly disclaims any responsibility for such usage which shall be made at Your sole risk. WARRANTY

Arrow warrants that it has the right to provide the evaluation board to you. This warranty is provided by Arrow in lieu of all other warranties, written or oral, statutory, express or implied, including any warranty as to merchantability, non-infringement, fitness for any particular purpose, or uninterrupted or error-free operation, all of which are expressly disclaimed. The evaluation board is provided "as is" without any other rights or warranties, directly or indirectly.

You warrant to Arrow that the evaluation board is used only by electronics experts who understand the dangers of handling and using such items, you assume all responsibility and liability for any improper or unsafe handling or use of the evaluation board by you, your employees, affiliates, contractors, and designees.

LIMITATION OF LIABILITIES

In no event shall Arrow be liable to you, whether in contract, tort (including negligence), strict liability, or any other legal theory, for any direct, indirect, special, consequential, incidental, punitive, or exemplary damages with respect to any matters relating to this agreement. In no event shall arrow's liability arising out of this agreement in the aggregate exceed the amount paid by you under this agreement for the purchase of the evaluation board.

INDEMNIFICATION

You shall, at Your expense, defend Arrow and its Affiliates and Licensors against a claim or action brought by a third party for infringement or misappropriation of any patent, copyright, trade secret or other intellectual property right of a third party to the extent resulting from (1) Your combination of the Evaluation Board with any other component, system, software, or firmware, (2) Your modification of the Evaluation Board, or (3) Your use of the Evaluation Board in a manner not permitted under this Agreement. You shall indemnify Arrow and its Affiliates and Licensors against and pay any resulting costs and damages finally awarded against Arrow and its Affiliates and Licensors or agreed to in any settlement, provided that You have sole control of the defense and settlement of the claim or action, and Arrow cooperates in the defense and furnishes all related evidence under its control at Your expense. Arrow will be entitled to participate in the defense of such claim or action and to employ counsel at its own expense.

RECYCLING

The Evaluation Board is not to be disposed as an urban waste. At the end of its life cycle, differentiated waste collection must be followed, as stated in the directive 2002/96/EC. In all the countries belonging to the European Union (EU Dir. 2002/96/EC) and those following differentiated recycling, the Evaluation Board is subject to differentiated recycling at the end of its life cycle, therefore: It is forbidden to dispose the Evaluation Board as an undifferentiated waste or with other domestic wastes. Consult the local authorities for more information on the proper disposal channels. An incorrect Evaluation Board disposal may cause damage to the environment and is punishable by the law.