

Apalis Heatsink

Datasheet



Revision History

Date	Doc. Rev.	Heatsink Version	Changes
07-Nov-2014	Rev. 1.0	V1.0A	Initial release
13-Nov-2013	Rev 1.1	V1.0A	Section 3, Compatibility: minor updates
25-Nov-2014	Rev 1.2	V1.0A	Section 2, Technical specifications: updated details Section 4, Mechanical Dimensions: updated figure 1 (TIM pad thickness, Type 1) Section 5, Assembly: minor updates Section 6, Product Compliance: added compliance details
04-April-2016	Rev 1.3	V1.0A	Section 3, Compatibility: updated compatible module list. Apalis Heatsink Type 3 can be used with Apalis TK1 module
12-Jan-2017	Rev 1.4	V1.0A	Section 3, Compatibility: updated compatible module list. Add Apalis iMX6D IT
07-July-2017	Rev 1.5	V1.0A	Section 1.1, Reference Documents: Added reference documents section Section 2: Technical specification: Updated TIM Volume Resistivity value, added TIM supplier contact details
20-Dec-2017	Rev 1.6	V1.0B	New product release V1.0B. New TIM details added to the document Various small modifications.
26-Sept-2018	Rev 1.7	V1.0B	Section 1.1, Reference Documents: Added reference to compatible Fans and Screws
07-Nov-2018	Rev 1.8	V1.0A (Type-4)	Section 2, Technical Specification: Updated section headings Section 3, Compatibility: Updated compatible module list. Add Apalis iMX8 Section 4, Mechanical Dimensions: Added Apalis Heatsink Type -4 dimensional diagram
21-Jan-2021	Rev 1.9	V1.0B	Document: Updated section headings to include the Apalis Heatsink Type4 V1.0B product version. Various cosmetic improvements. Section 1, Introduction: Updated compatible Fan reference Section 3, Compatibility: Updated compatible module list. Add Apalis iMX8X Section 4, Mechanical Dimensions: Updated Apalis Heatsink Type -4 mechanical drawing Section 7, Storage Requirements: This section has been added to the document
6-Oct-2022	Rev 1.10	V1.0B	Section 4.2: Added general tolerances Section 5.1: Added details about screws maximum tightening torque Changed contact email address

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1. Introduction

The Apalis Heatsink is a complete thermal solution. It is mounted to the Apalis carrier board by means of 4 screws of M3 thread each. The screws can be mounted from the top. There are additional threaded holes for attaching a fan to the carrier board, if required.

1.1. Reference Documents

For detailed technical information about suitable computer modules, please refer to the documents listed below.

1.1.1 Apalis Computer Modules

An overview of the Apalis product family:

<https://www.toradex.com/computer-on-modules/apalis-arm-family>

1.1.2 Toradex Developer Website - Apalis Carrier Boards

<http://developer.toradex.com/products/apalis-evaluation-board>

<http://developer.toradex.com/products/ixora-carrier-board>

1.1.3 Thermal Interface Material (TSP600) Datasheets

The datasheets of Thermal Interface Material used on the Apalis Heatsink can be downloaded by using the following links:

Apalis Heatsink V1.0A (Type – 1/2/3)

<https://docs1.toradex.com/104905-apalis-Heatsink-thermal-interface-material-tsp600-g35-datasheet.pdf>

Apalis Heatsink V1.0B (Type – 1/2/3) and V1.0A/V1.0B (Type – 4)

<https://docs1.toradex.com/104906-apalis-Heatsink-thermal-interface-material-tsp600-z45-datasheet.pdf>

1.1.4 Compatible Fan: Apalis Heatsink Fan

<https://developer1.toradex.com/products/accessories/add-on/apalis-heatsink-fan>

1.1.5 TIM Supplier Contact Details

CTX Thermal Solutions GmbH
Lötscher Weg 104
D-41334 Nettetal
Telefon: +49 2153 7374 -0
Telefax: +49 2153 7374 -10
E-Mail: info@ctx.eu
Website: www.ctx.eu

2. Technical Specifications

2.1. Apalis Heatsink V1.0A (Type – 1/2/3)

Material	Aluminum alloy AL6063-T5	Remarks
Coating	Black anodized	
Thermal conductivity	190 to 221 W/(mK)	Temperature Range: 40°C to 100°C
Weight	39 grams	
TIM, Thermal conductivity	6.0 W/(mK)	Thermal Interface Material (TSP600-G35)
TIM, Flame Rating	UL 94V-0	
TIM, Volume Resistivity	6.5 ¹⁰ Ohm-meter	
TIM, Dielectric Constant	26.7 @ 1000 Hz	
TIM, Dielectric Breakdown Voltage	>1500~>5500 V(AC)	
TIM, Continuous Use Temperature	-40°C to +200°C	
TIM, Density	3.7 g/cc	
TIM, Tensile strength	28 PSI	
TIM, Hardness Bulk Rubber	30~55 (Shore C)	
Thermal resistance (Module-Alu)	TBD	Please note that the temperature of the module is measured by the on-module thermal sensor.
Thermal resistance (Alu-Ambient without fan)	<5.90 °C/W	
Thermal resistance (Alu-Ambient with fan)	<2.90 °C/W	Test fan details: Dimensions: 40mmX40mmX10mm (LxWxH) Speed: 4000 RPM Air Flow: 4.81 CFM

2.2. Apalis Heatsink V1.0B (Type – 1/2/3) and V1.0A/V1.0B (Type – 4)

Material	Aluminum alloy AL6063-T5	Remarks
Coating	Black anodized	
Thermal conductivity	190 to 221 W/(mK)	Temperature Range: 40°C to 100°C
Weight	39 grams	
TIM, Thermal conductivity	6.0 W/(mK)	Thermal Interface Material (TSP600-Z45)
TIM, Flame Rating	UL 94V-0	
TIM, Volume Resistivity	10 ¹⁴ Ohm-meter	
TIM, Dielectric Constant	4.84 @ 1000 Hz	
TIM, Dielectric Breakdown Voltage	7.5 (KV/AC)	
TIM, Continuous Use Temperature	-40°C to +200°C	
TIM, Density	3.3±0. 2 g/cc	
TIM, Tensile strength	29.526 PSI	
TIM, Hardness Bulk Rubber	45 (Shore C)	
Thermal resistance (Module-Alu)	TBD	Please note that the temperature of the module is measured by the on-module thermal sensor.
Thermal resistance (Alu-Ambient without fan)	<5.90 °C/W	
Thermal resistance (Alu-Ambient with fan)	<2.90 °C/W	Test fan details: Dimensions: 40mmX40mmX10mm (LxWxH) Speed: 4000 RPM Air Flow: 4.81 CFM

3. Compatibility

There are multiple types of Apalis Heatsinks. Each type of Apalis Heatsink is compatible with specific Apalis modules.

The following table shows the compatibility of the Apalis Heatsinks and the Apalis modules:

Apalis Module	Compatible Apalis Heatsink
Apalis iMX6Q IT and Apalis iMX6D IT	23051000 Apalis Heatsink Type 1 V1.0A 23051001 Apalis Heatsink Type 1 V1.0B
Apalis T30	23061000 Apalis Heatsink Type 2 V1.0A 23061001 Apalis Heatsink Type 2 V1.0B
Apalis iMX6Q, Apalis iMX6D and Apalis TK1	23071000 Apalis Heatsink Type 3 V1.0A 23071001 Apalis Heatsink Type 3 V1.0B
Apalis iMX8	2308100 Apalis Heatsink Type 4 V1.0A
Apalis iMX8, Apalis iMX8X	2308101 Apalis Heatsink Type 4 V1.0B

4. Mechanical Dimensions

The following drawings illustrate the mechanical dimensions of the Apalis Heatsink.
All measurements are in millimeters (mm).

4.1. Heatsink Dimensions

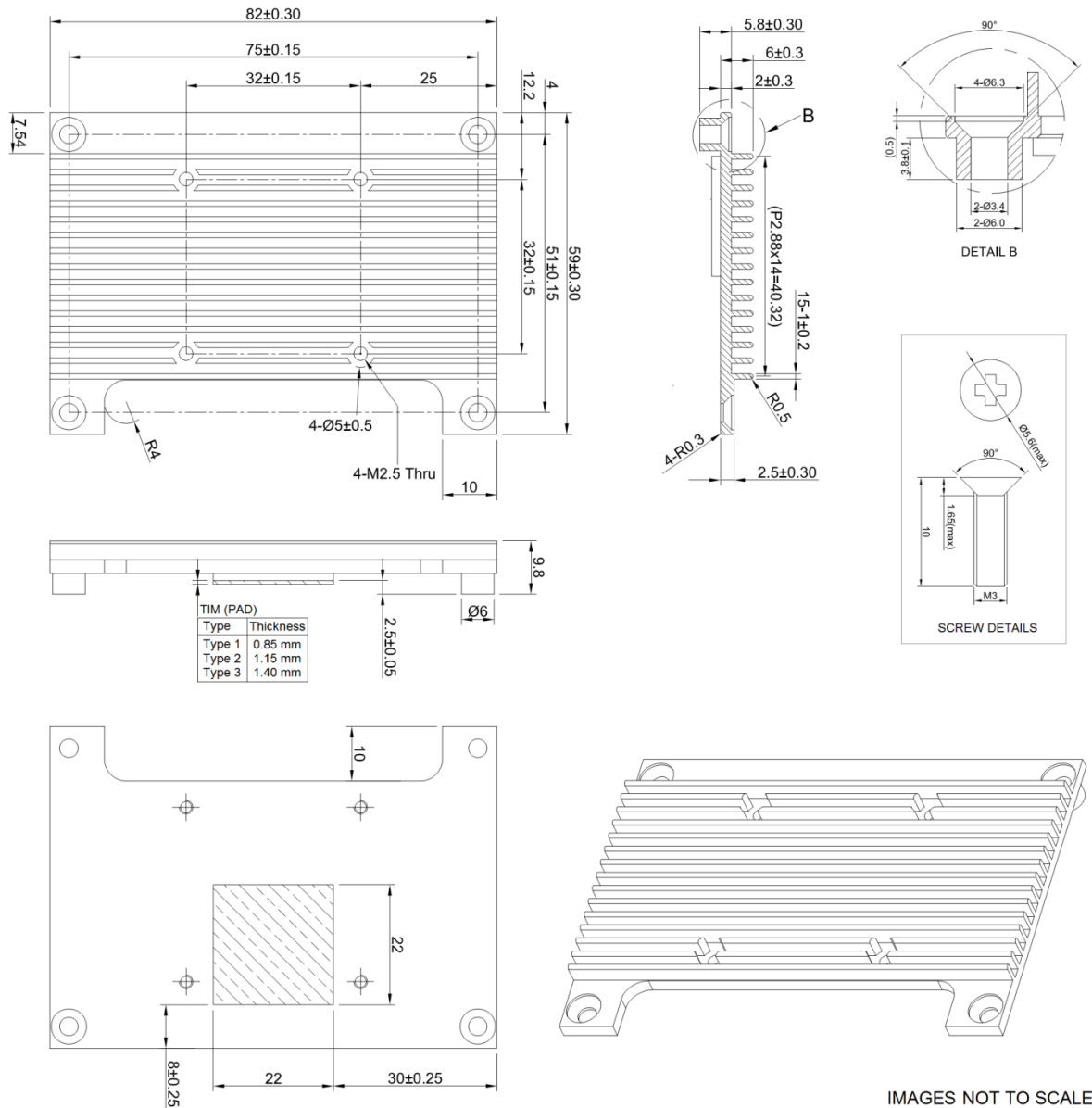


Figure 1-A: Apalis Heatsink Dimensions (Type-1/2/3)

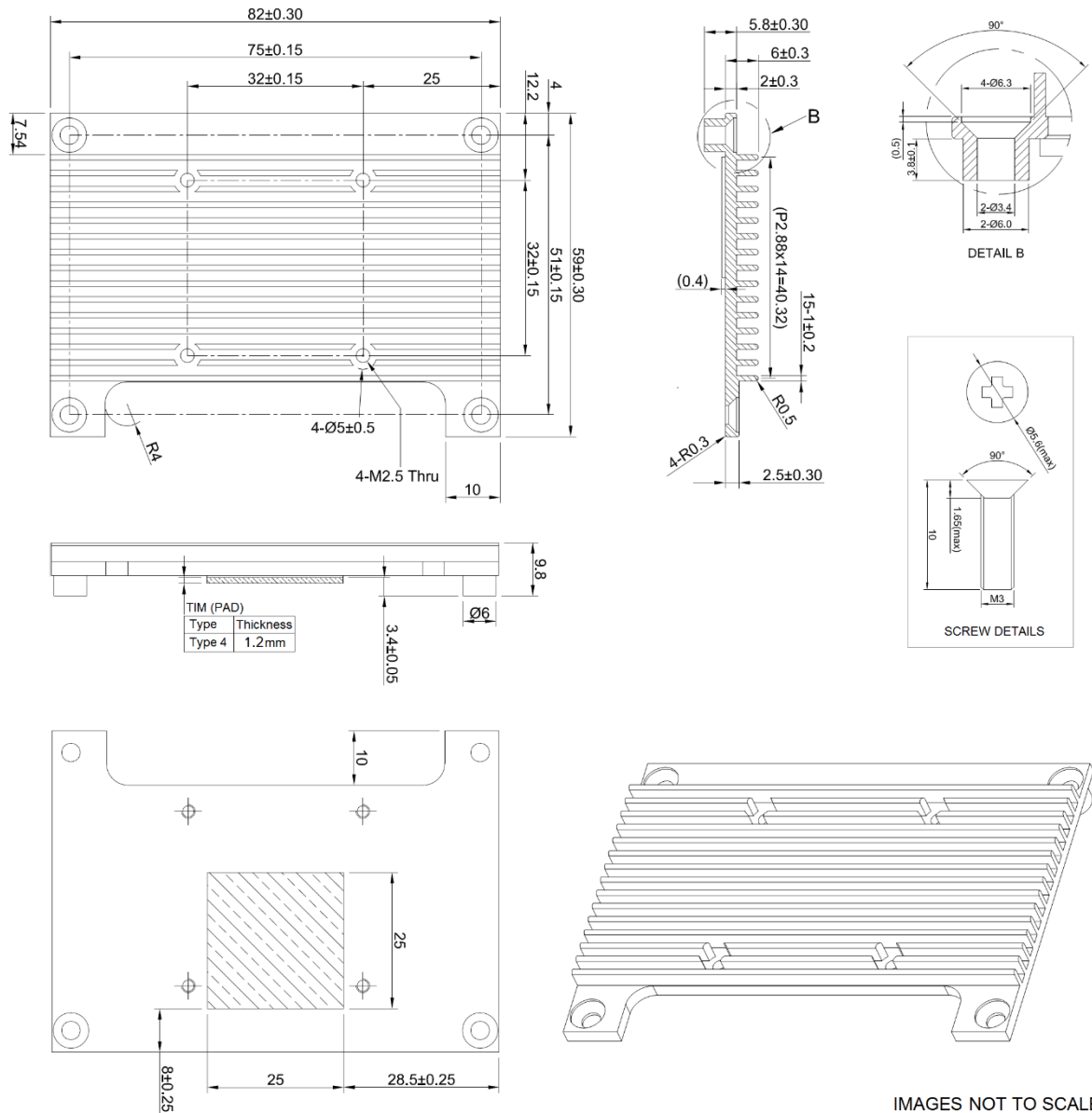


Figure 1-B: Apalis Heatsink Dimensions (Type-4)

4.2. General Tolerances

When not explicitly specified, the following tolerances apply to the product:

Dimensions	Tolerance
Over 1000	±1.20
400~1000	±0.80
120~400	±0.50
30~120	±0.30
6~30	±0.20
0.5~6	±0.10
ANGLES	0.5°

R or C angle is less than 0.5° if not indicated.

5. Assembly

Assembly must be done very carefully since putting the Apalis Heatsink in a wrong orientation will damage the Apalis module or prevent the system from working correctly. The illustration shown below represents how to attach the heatsink solution.

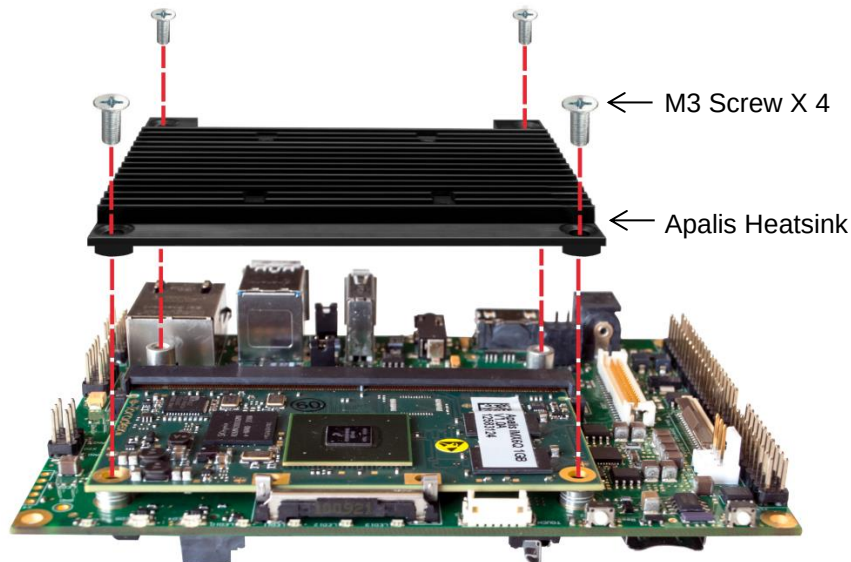


Figure 2: Apalis Heatsink assembly

5.1. Assembly procedure

The following procedure demonstrates how to attach the Apalis Heatsink to the Apalis module to complete the heatsink solution. Please read the instructions and follow the procedure very carefully to ensure that the module does not get damaged. Necessary precautions should be taken to avoid the build-up of electrostatic charges.

1. Clean the processor's top surface using an anti-static cloth.
2. Insert the Apalis module in the MXM socket X1 on the Apalis carrier board.
3. Carefully remove the plastic foil from the TIM.



Figure 3: Remove plastic foil from the TIM

4. Carefully align the mounting holes {1}, {2}, {3}, and {4} on the Apalis Heatsink to be in-line with fasteners available on the Apalis carrier board. Place the Apalis Heatsink on the system.

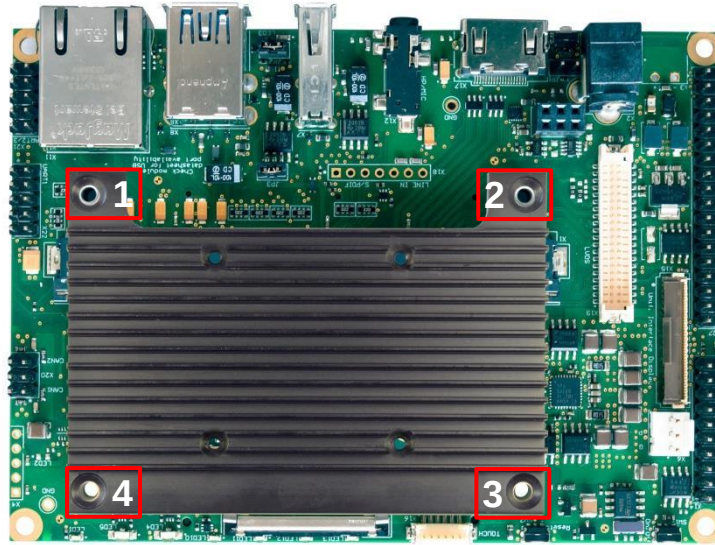
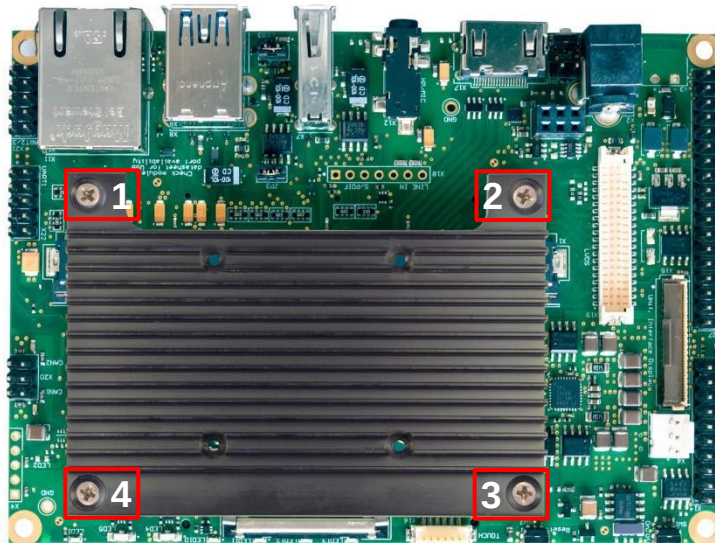


Figure 4: Align Apalis Heatsink screw holes with the fasteners

5. Use four units of M3-sized screws to affix the Apalis Heatsink to the system. The maximum tightening torque specified by the spacers mounted on the Apalis carrier boards is 0.2 Nm.



6.

Figure 5: Affix Apalis Heatsink with the system using M3 sized screws

7. Done. The system is now ready for use.
8. For application, which results in the prolonged overheating of the processor, either due to environmental conditions (like higher ambient temperature) or due to very high computational power; the DC fan can be mounted on the Apalis' top Heatsink using 2.5m screws (4 units).
For the majority of the end applications, an additional heatsink fan will not be required.

6. Product Compliance

Up-to-date information about product compliance such as RoHS, CE, UL-94, Conflict Mineral, REACH, etc. can be found on our website at <http://www.toradex.com/support/product-compliance>

7. Storage Requirements

Shelf life is the period of time that a product is expected to remain within its approved product specification while stored under defined conditions.

The most significant factor limiting the Apalis Heatsink's shelf life is the mylar film used to protect the TIM when the product is not assembled on the computer module.

The following table shows the storage requirements and the shelf life of the Apalis Heatsink.

Short periods during which the product is subjected to slightly off-specification environmental conditions will not significantly impact shelf life.

Storage Measures	Ambient Atmosphere	Storage Temperature	Storage Relative Humidity	Maximum Storage Time
Original packing	Air	20°C to 30°C	40% to 60%	24 months

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