



Application Note

# Astra™ Machina Foundation Series MIPI DSI to HDMI Hardware Connection

**Abstract:** This document provides a detailed guide on connecting the Astra Machina Foundation Series to HDMI displays via a MIPI DSI to HDMI converter, including required hardware, connection diagrams, and setup instructions for seamless video and audio transmission.

# Contents

1.	Overview.....	4
1.1.	Scope.....	4
1.2.	Accessories Hardware Items Needed.....	4
1.3.	Connection Block Diagram.....	5
1.4.	Making the Connections.....	6
1.5.	Basic information of MIPI DSI to HDMI Conversion.....	8
2.	References.....	9
3.	Revision History.....	10

Downloaded by Anonymous () on 21 Jun 2026 02:54:09 UTC

## List of Figures

Figure 1. Overview of Astra Machina Foundation Series.....	4
Figure 2. Connection block diagram for MIPI DSI to HDMI Conversion .....	5
Figure 3. Connector Actuator Status & FFC cable side .....	6
Figure 4. Complete connection with MIPI to HDMI converter board (top view).....	7
Figure 5. Complete connection with MIPI to HDMI converter board (bottom view) .....	7

Downloaded by Anonymous () on 21 Jun 2026 02:54:09 UTC

# 1. Overview

The Astra™ Machina Foundation Series offers evaluation-ready kits that facilitate quick and straightforward prototyping with the Synaptics SL-Series of embedded Linux® and Android™ processors. Featuring a modular design, these kits include interchangeable core compute modules, a standard I/O board and variety of daughter cards for connectivity, debugging, and various I/O configurations.

## 1.1. Scope

This document provides a clear MIPI DSI to HDMI Conversion connection diagram that is applicable to Core Module with SL1680/SL1640/SL1620 SoC embedded inside. This ensures to fulfill MIPI DSI to mate the popular TV with Synaptics designed-in DSI to HDMI converter board.

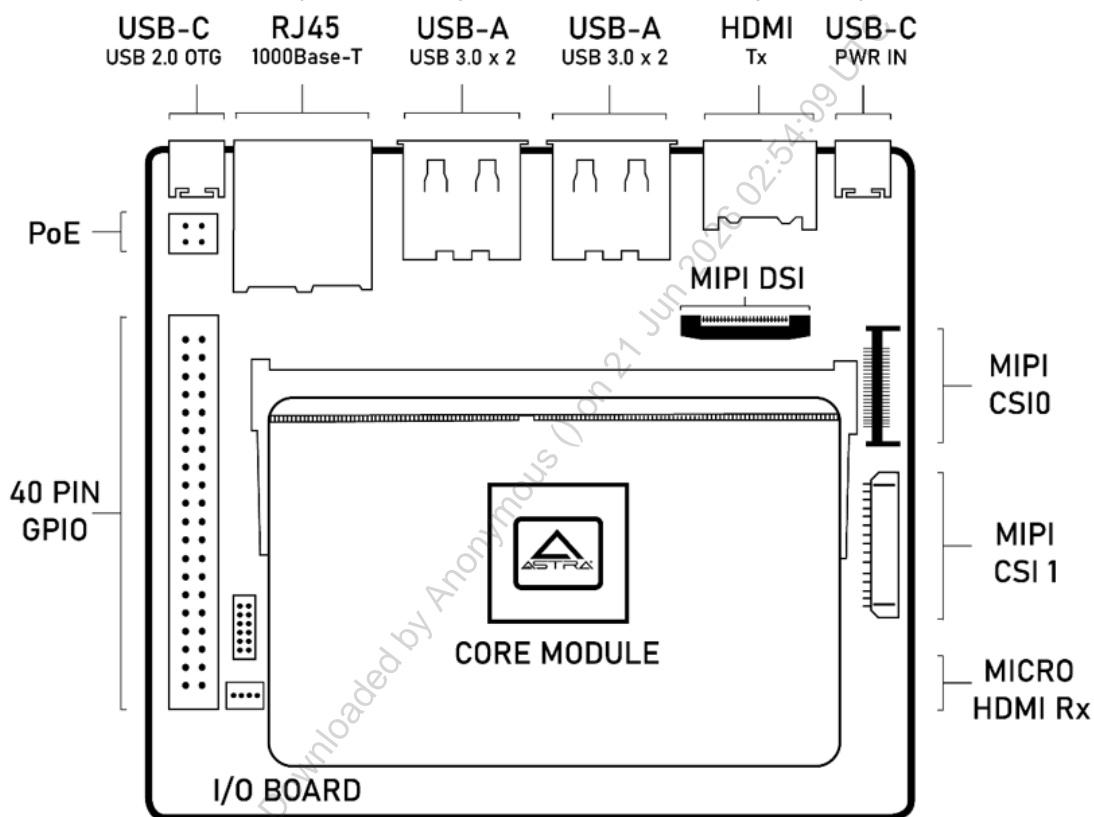


Figure 1. Overview of Astra Machina Foundation Series

## 1.2. Accessories Hardware Items Needed

- [a] Astra Machina Foundation Series.
- [b] Synaptics DSI to HDMI converter board to convert MIPI to HDMI Tx (PN: 730-C01076-01)
- [c] TV with HDMI Type A Rx.
- [d] 22-pin/0.5mm pitch FFC cable and standard HDMI Type A Cable.
- [e] DuPont Bread board Jumper wires in female on both ends.

### 1.3. Connection Block Diagram

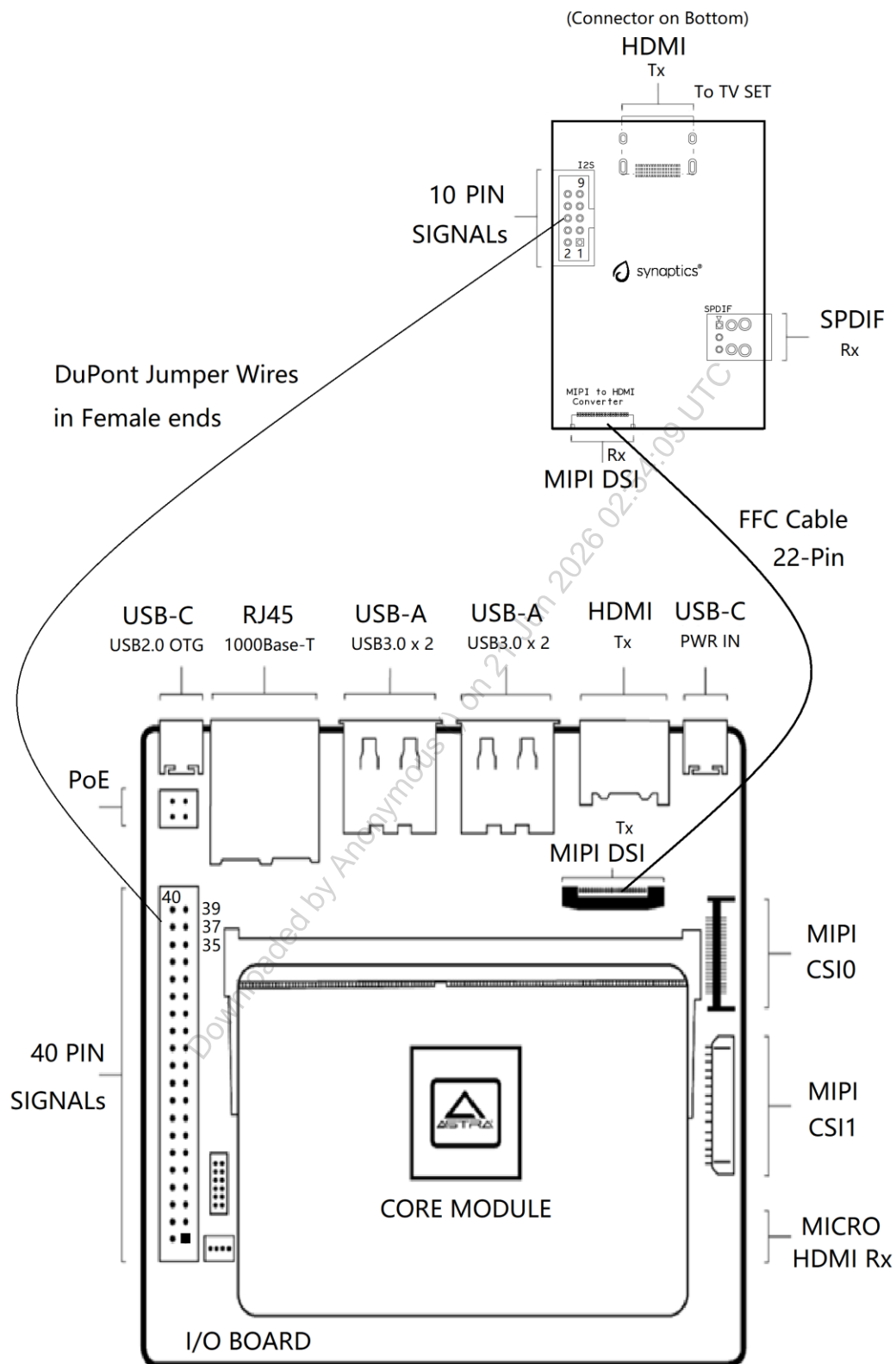


Figure 2. Connection block diagram for MIPI DSI to HDMI Conversion

## 1.4. Making the Connections

- [a] Get any type of SL series of Core Module stuffed with Astra I/O Board.
- [b] Connect a HDMI Type A cable between TV and DSI to HDMI Converter Board, shown in [Figure 5](#).
- [c] Connect a FFC cable in the length of 51mm between MIPI DSI connector of Astra I/O Board and FFC connector of DSI to HDMI converter board, as shown in [Figure 2](#). Note that the Actuator of FFC connector on either I/O board or converter board **MUST** be open prior to FFC cable being plugged as well as FFC being stiffener film side for orientation, shown in [Figure 3](#) and [Figure 4](#).
- [d] Connect DuPont Jumper wires per below pin-pairs to enable HDMI audio, as shown in [Figure 2](#).

Astra I/O Board	Signals	Converter Board
40 PIN#		10 PIN#
35	I2S_LRCK	5
37	I2S_MCLK	9
38	I2S_BCLK	7
40	I2S_DATA	3
39	GND	8
34	GND	6

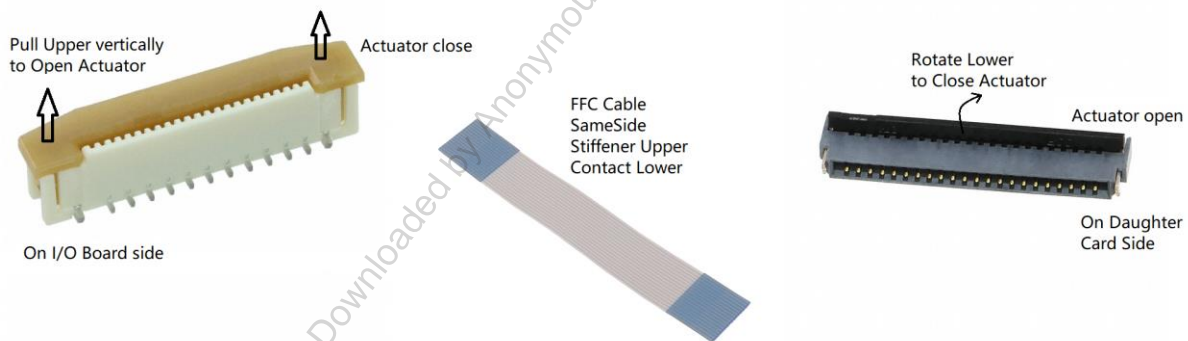


Figure 3. Connector Actuator Status & FFC cable side

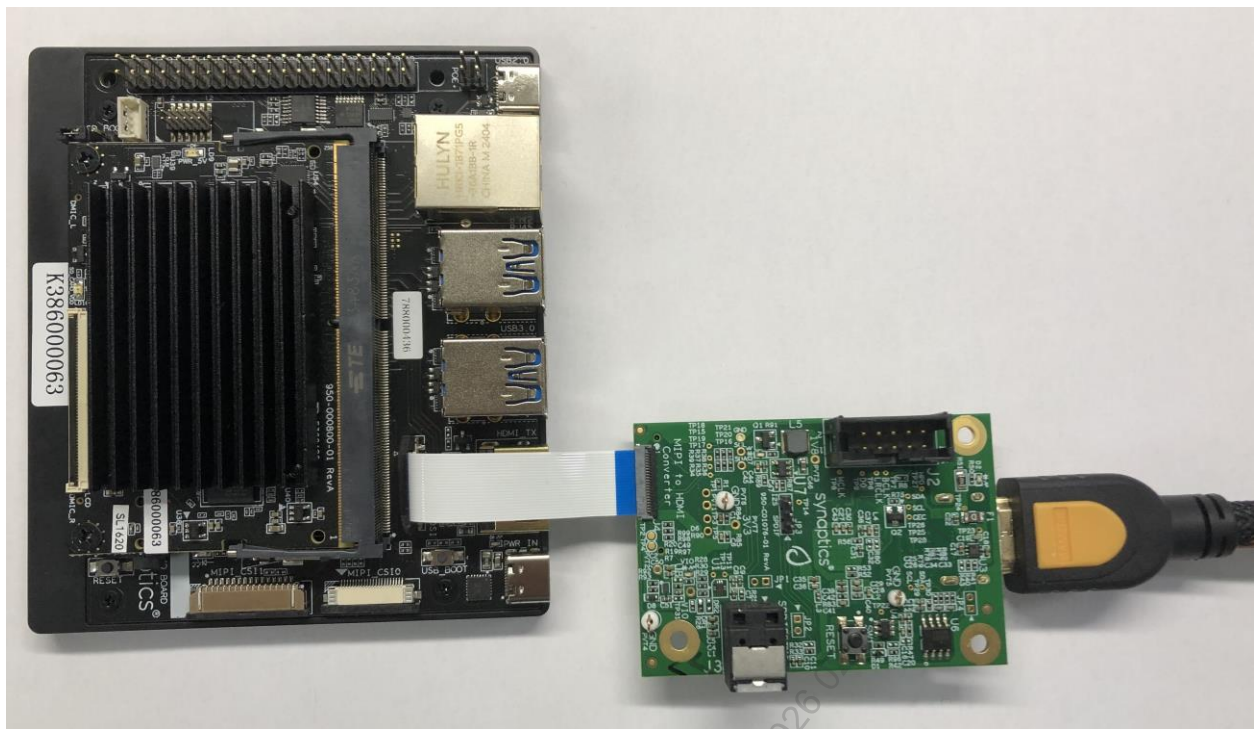


Figure 4. Complete connection with MIPI to HDMI converter board (top view)

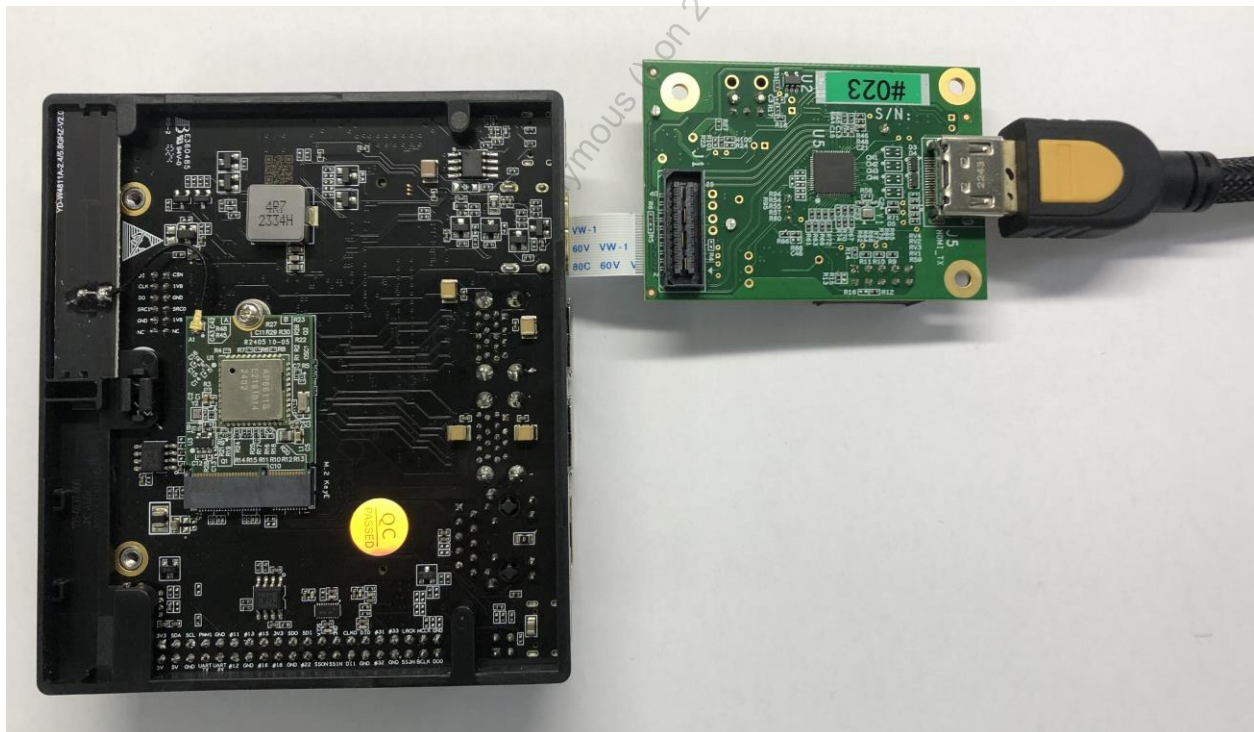


Figure 5. Complete connection with MIPI to HDMI converter board (bottom view)

## 1.5. Basic information of MIPI DSI to HDMI Conversion

- The Synaptics DSI to HDMI converter board, featuring the Lontium LT9611 converter, requires auxiliary wire connections for HDMI audio..
- The HDMI output supports resolutions up to 4K2K at 30fps or 1080p at 60fps..

Downloaded by Anonymous () on 21 Jun 2026 02:54:09 UTC

## 2. References

---

- *Astra Machina Foundation Series Quick Start Guide* (PN: 511-001404-01)
- *Astra Machina SL1620 Developer Kit User Guide* (PN: 511-001407-01)
- *Astra Machina SL1640 Developer Kit User Guide* (PN: 511-001405-01)
- *Astra Machina SL1680 Developer Kit User Guide* (PN: 511-001403-01)
- *Synaptics DSI to HDMI converter board* (PN: 730-C01076-01)

Downloaded by Anonymous () on 21 Jun 2026 02:54:09 UTC

## 3. Revision History

Revision	Description
A	Initial release
B	Minor correction to cross-reference links in section 1.4 (Making the Connections).
C	Minor update to latest template and corrected document title.

Downloaded by Anonymous () on 21 Jun 2026 02:54:09 UTC



#### Copyright

Copyright © 2024–2025 Synaptics Incorporated. All Rights Reserved.

#### Trademarks

Astra Machina, SyNAP, Synaptics and the Synaptics logo are trademarks or registered trademarks of Synaptics Incorporated in the United States and/or other countries.

Android is a trademark of Google LLC. Linux is the registered trademark of Linus Torvalds in the U.S. and other countries. All other trademarks are the properties of their respective owners.

#### Contact Us

Visit our website at [www.synaptics.com](http://www.synaptics.com) to locate the Synaptics office nearest you.

PN: 506-001523-01 Rev C

#### Notice

Use of the materials may require a license of intellectual property from a third party or from Synaptics. This document conveys no express or implied licenses to any intellectual property rights belonging to Synaptics or any other party. Synaptics may, from time to time and at its sole option, update the information contained in this document without notice.

INFORMATION CONTAINED IN THIS DOCUMENT IS PROVIDED "AS-IS," AND SYNAPTICS HEREBY DISCLAIMS ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTIES OF NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHTS. IN NO EVENT SHALL SYNAPTICS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OF THE INFORMATION CONTAINED IN THIS DOCUMENT, HOWEVER CAUSED AND BASED ON ANY THEORY OF LIABILITY, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, AND EVEN IF SYNAPTICS WAS ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. IF A TRIBUNAL OF COMPETENT JURISDICTION DOES NOT PERMIT THE DISCLAIMER OF DIRECT DAMAGES OR ANY OTHER DAMAGES, SYNAPTICS' TOTAL CUMULATIVE LIABILITY TO ANY PARTY SHALL NOT EXCEED ONE HUNDRED U.S. DOLLARS.