Application Note

Astra™ Machina Foundation Series – Maximum Power VCORE/VCPU Consumption

Abstract: This application note outlines the maximum VCORE and VCPU power consumption of Synaptics SL-Series processors to aid in the proper selection of power management ICs (PMICs).

Contents

1. Overview

The Astra™ Machina Foundation Series provides evaluation-ready kits for easy and quick prototyping with Synaptics SL–Series embedded Linux® and Android™ processors. These kits feature a modular design, including interchangeable core compute modules, a standard I/O board, and daughter cards for connectivity, debugging, and various I/O configurations.

1.1. Scope

This document outlines the power consumption of the main power rails, VCORE and VCPU, for the SL1680, SL1640, and SL1620 models.
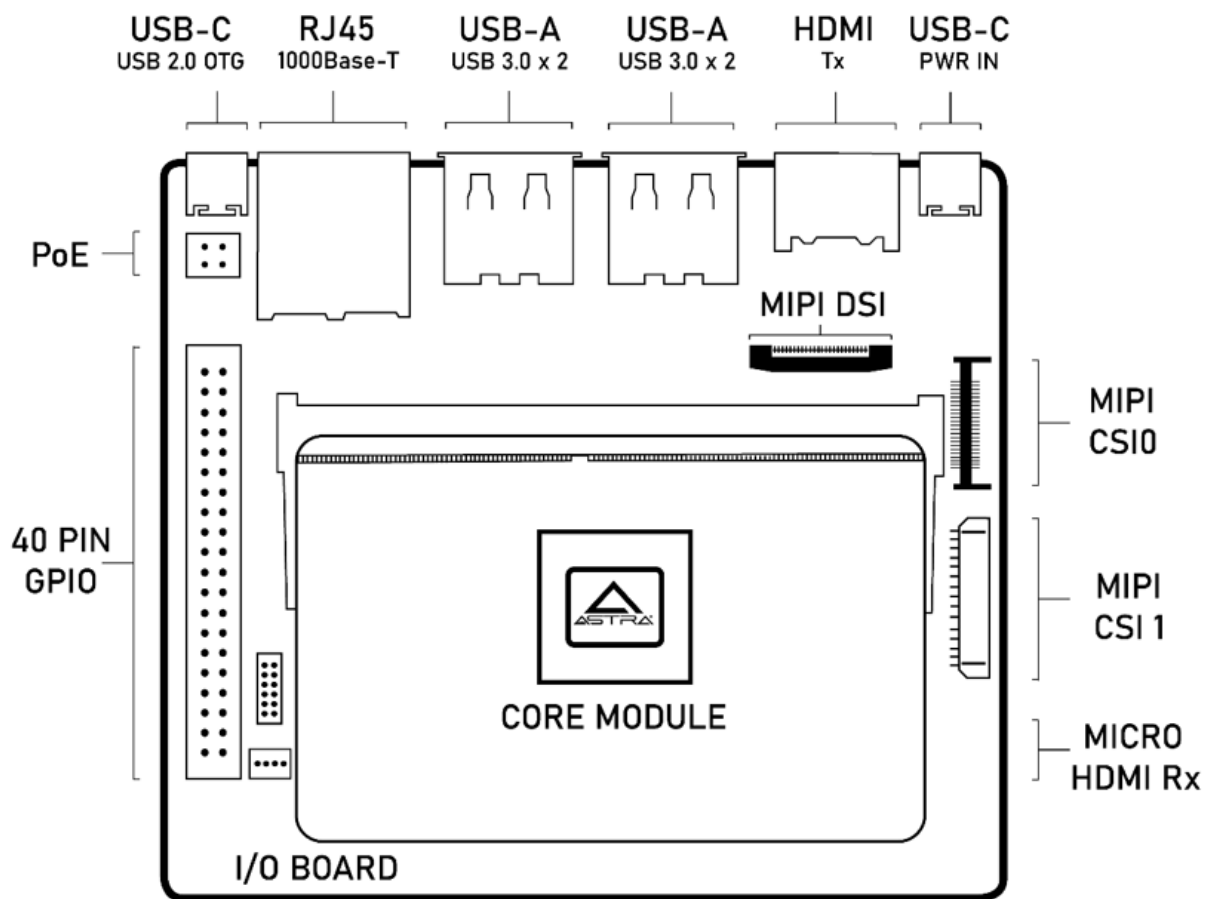

Figure 1. Astra Machina Foundation Series overview

1.2. Maximum VCORE/VCPU Power Consumption for SL1680, SL1640, and SL1620

SL16x0 SoC Consumer Grade	Tj @ °C	Test Condition	Powe Rails (Typ: 0.8V)	Max. Power (mW)
SL1620	105	Quad Vcpu: 1900 MHz DDR4 2133 Mbps, GPU 1000 MHz	VCORE	2000
SL1640	105	Quad CPU 2000 MHz DDR4 3200 Mbps GPU/V4G/DSP 900 MHz NPU/TSP 800 MHz	VCPU	1550
			VCORE	1600
SL1680	105	Quad CPU 2100 MHz LPDDR4x 3733 Mbps GPU/DSP 900 MHz NPU/TSP 800 MHz V4G 1100 MHz	VCPU	3700
			VCORE	3600

1.3. Optimized Power Consumption for SL1680, SL1640, and SL1620

In practical applications, Dynamic Voltage Frequency Scaling (DVFS) enables the software and hardware to work together, automatically adjusting voltage and frequency values based on specific use case requirements. As a result, overall system power consumption depends on both software optimization and hardware implementation.

2. References

The following documentation are associated with the Astra Machina Foundation Series:

- *Astra Machina Foundation Series Quick Start Guide* (PN: 511-001404-01)
- *Astra Machina SL1680 Developer Kit User Guide* (PN: 511-001403-01)
- *Astra Machina SL1640 Developer Kit User Guide* (PN: 511-001405-01)
- *Astra Machina SL1620 Developer Kit User Guide* (PN: 511-001407-01)

3. Revision History

Revision	Description
A	Initial release.
B	Updated title of section 1.2 (Maximum VCORE/VCPU Power Consumption for SL1680, SL1640, and SL1620) and refined section 1.3 (Optimized Power Consumption for SL1680, SL1640, and SL1620) to improve readability.