Product Overview

AM62L - Low Power Cortex A53 SoC for Cost Optimized IOT, HMI, and General-Purpose Applications

Introduction

The AM62L Arm®-based processor is a low-cost, power-efficient system-on-chip (SoC) that is designed for a wide range of industrial and general-purpose applications. The device is designed for smart metering, EV charging, IOT gateways, industrial HMI, patient monitoring and much more.

With up to two Arm Cortex®-A53 cores, the AM62L processor provides robust computing with necessary security features such as secure boot. The device enables fast and efficient development with scalable software development kits (SDK) compatible with the full processor portfolio and open-source hardware and software tools. The SDK includes the AM62L, AM623/AM625, AM62P and other TI Processors.

Target Applications and Key Markets

- *Building Automation*: smart home devices, gateway, HVAC controller, IoT devices, thermostat
- *Energy Infrastructure*: EV charging and supply equipment, smart meter
- *Industrial Automation*: Factory automation, robotics, industrial HMI, retail automation and payment
- *Medical*: Medical devices, patient monitoring systems

Key Features

- *CPU*: Dual-core ARM Cortex-A53, up to 1.25GHz
- *Memory*: Supports 16 bit LPDDR4 and DDR4
- *ADC*: 4 channel 10-bit ADC
- *Connectivity*: Dual Gigabit Ethernet, USB 2.0, 3x CAN-FD
- *Display*: 1x Display - MIPI DSI, DPI
- *Security*: Secure boot, hardware encryption, secure software updates (AES, SHA, PKA, RNG, SM3/4)
- *Operating Systems*: Linux®, FreeRTOS
- *Power Consumption*: Average industrial power consumption is <1W depending on usage and configuration
- *Temperature Range*: Support from -40 to 125ºC Junction

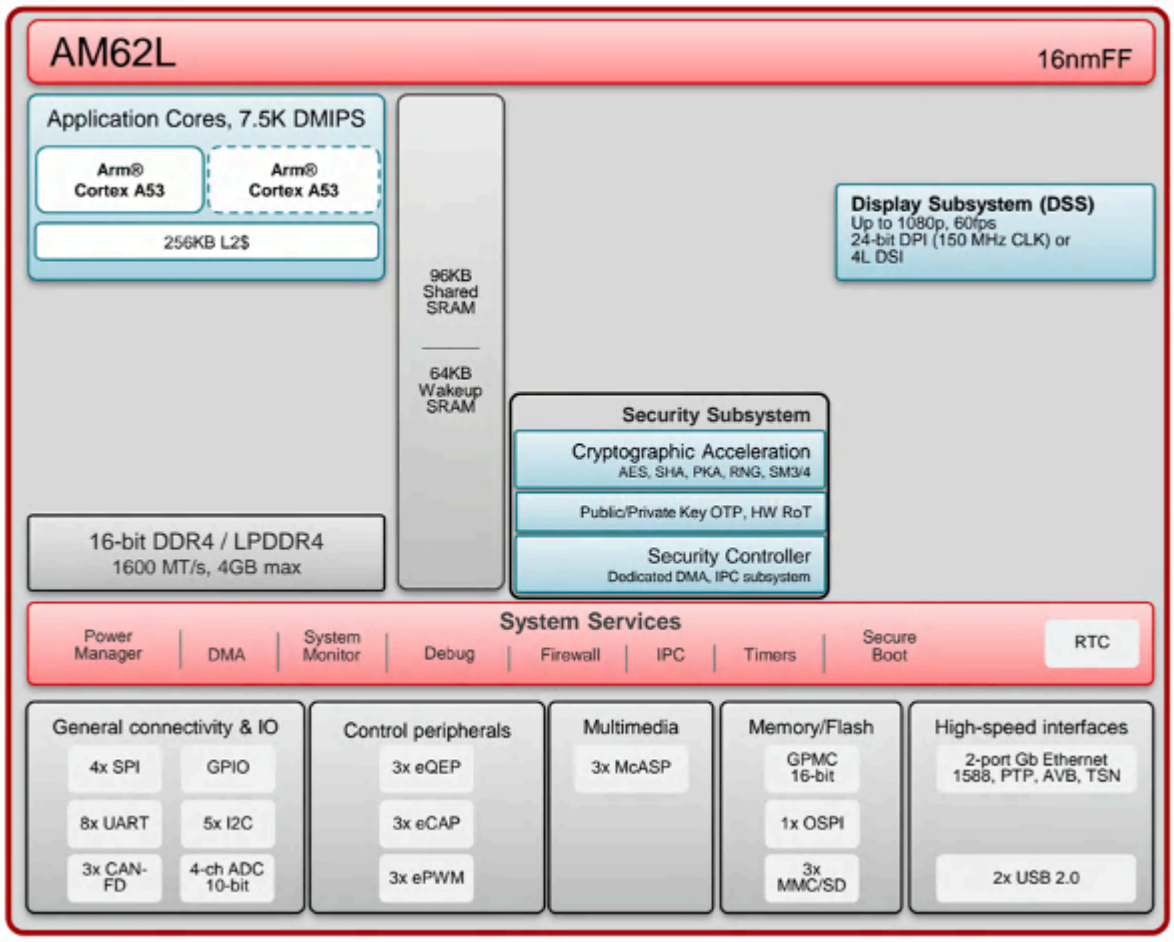

Figure 1. AM62L Block Diagram

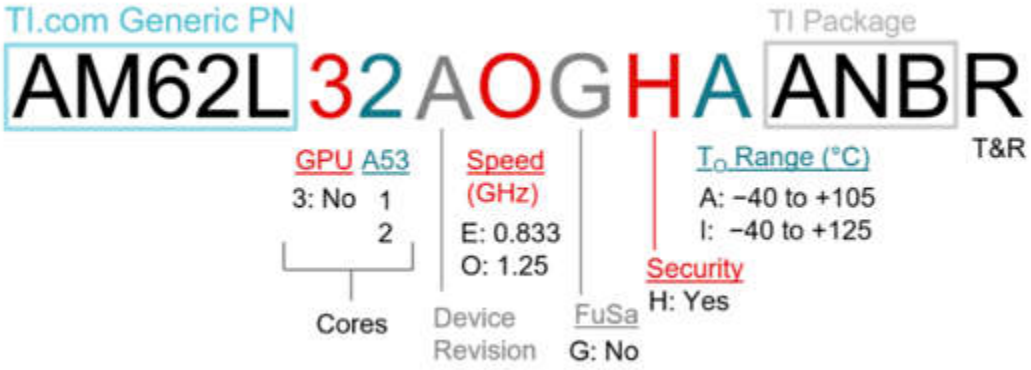

Figure 2. AM62L Taxonomy

Software

The AM62L SoC supports high-level operating systems, including both Linux and FreeRTOS. These are included as part of the Software Development Kits (SDKs). These SDKS are created for ease of development through the processor ecosystem with one SDK being used for all AM6x devices.

The SDKs are feature-rich and allow you to easily begin your software development on the AM62L device with integrated out of box demos and example code. The SDK has a long-term focus, with stable kernel support on the ARM Cortex-A53 cores. For development help, look to TI Developer Zone and E2E forums for support.

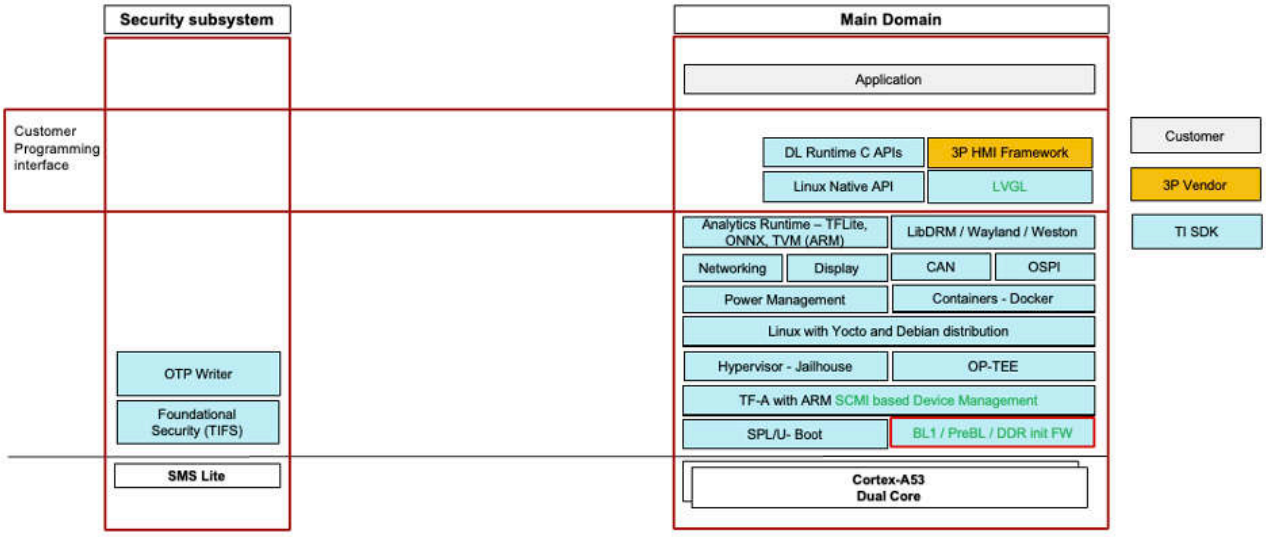

Figure 3. AM62L Domain Architecture

Power Management

The TPS65214 Power Management Integrated Circuit (PMIC) is specially designed to enhance performance of the AM62L and key peripherals. The TPS65214 integrates three DC-DC converters and two LDOs in a small 3.5x3.5mm^2 package and provides Linux drivers to support the AM62L low power modes along with other power management features. The TPS65214 offers several advantages, including accelerated time to market with a validated power design, a compact design for space-constrained applications, simplified bill of materials (BOM), and high efficiency converters with excellent transient response.

The TPS65214 provides an optimized design for managing power in AM62L-based systems, effectively balancing performance, energy efficiency, and small size.

Security

The AM62L SoC has several security features to better protect your end applications. The device supports secure boot with hardware-enforced root-of-trust and is a trusted execution environment. The device has support for firewall isolation and secure storage support, as well as cryptographic acceleration. Additionally, the device is security-enabled and can protect your device, system and keep your data safe. More information about the security can be seen in Figure 4.

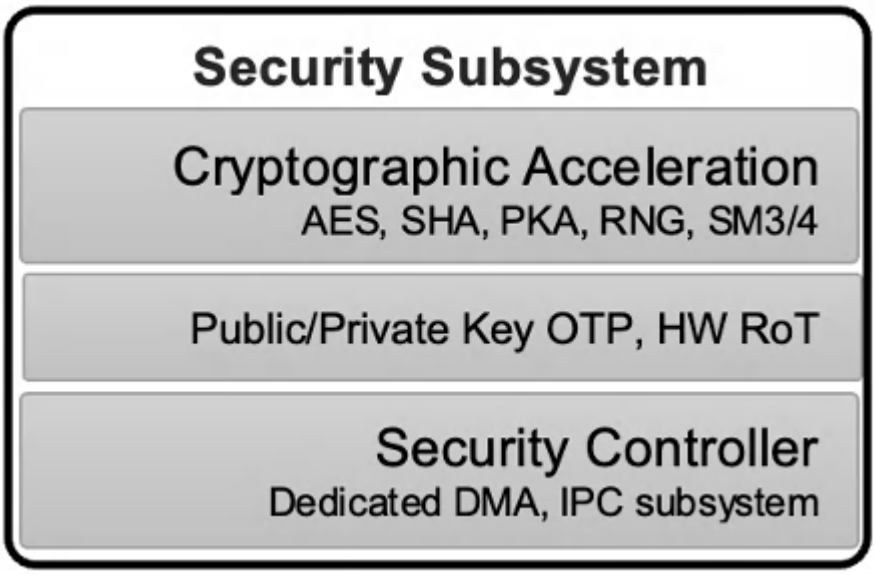

Figure 4. AM62L Security Subsystem

Scalability

The AM62L processors offer scalable performance and various multimedia and low power features. The AM62L devices are pin-to-pin compatible with each other, allowing designers to select the appropriate device for their system and easily adapt to requirement changes.

TI also offers a single Software Development kit (SDK) for the AM6x family which includes the AM62L, AM623, AM625, AM62P, as well as the rest of the processor portfolio. This simplifies the development process by providing a unified platform for software development, reducing time and effort spent on software integration and testing when using different processors. This scalability provides that developers can use the AM62L across different projects, including when moving to the higher performance AM62P and AM67 devices.

For example, you can use AM62L for a gateway, AM625 for a doorbell, and AM62P for a home control HMI, all utilizing the same software.

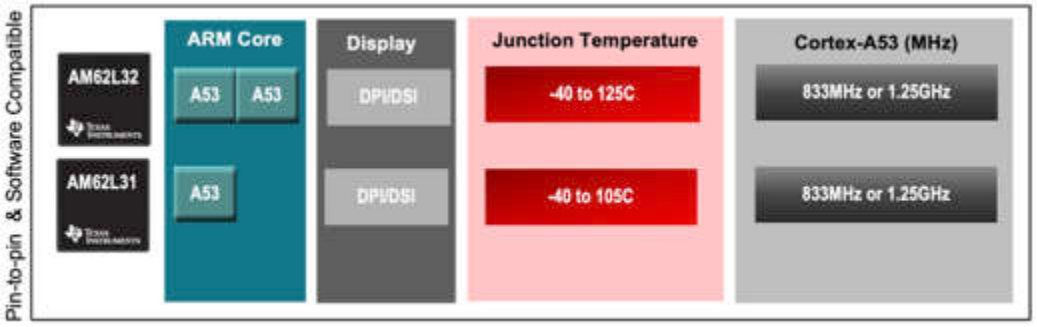

Figure 5. AM62L Scalable Variants

Demos

There are several demos to show the general-purpose application of AM62L. As shown in Figure 6, AM62L is capable of running a single display with 2D user interfaces (UI).

This demo showcases the fluidity of AM62Ls display capabilities of 2D graphics with our partner software graphic vendors and the ability to connect to end notes through matter, thread, and Zigbee. There are additional

demos in this Smart Home UI building automation demo, which focus on smart metering, EV Charging, Thermostat, Security, and audio playback.

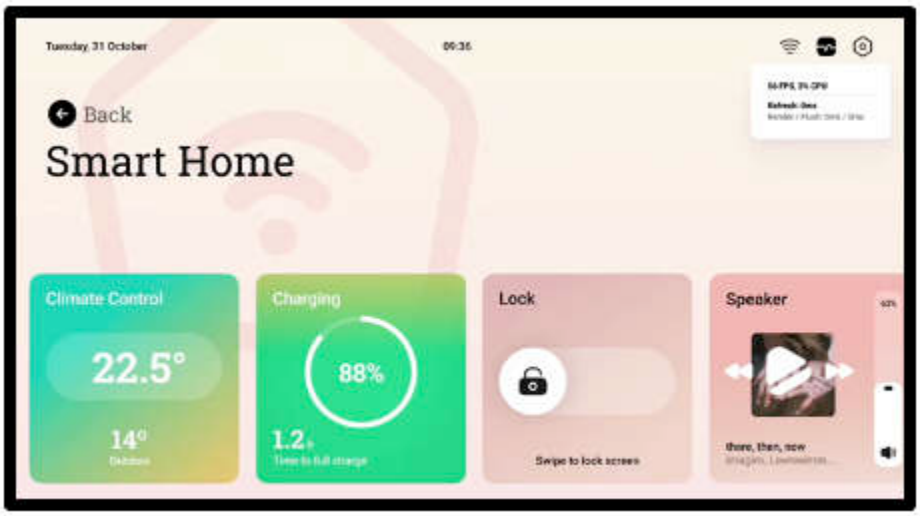

Figure 6. AM62L Smart Home UI

Evaluation Module

The AM62L Evaluation Module (EVM) is the TMDS62LEVM. This EVM allows use and test of the AM62L and exploration of the broad range of peripherals. The TMDS62LEVM has an HDMI display connector, M.2 connector, 2 Ethernet ports, temperature sensors, ADC and UART connections.

The TMDS62LEVM also has a software development kit (SDK) to start Linux and FreeRTOS development.

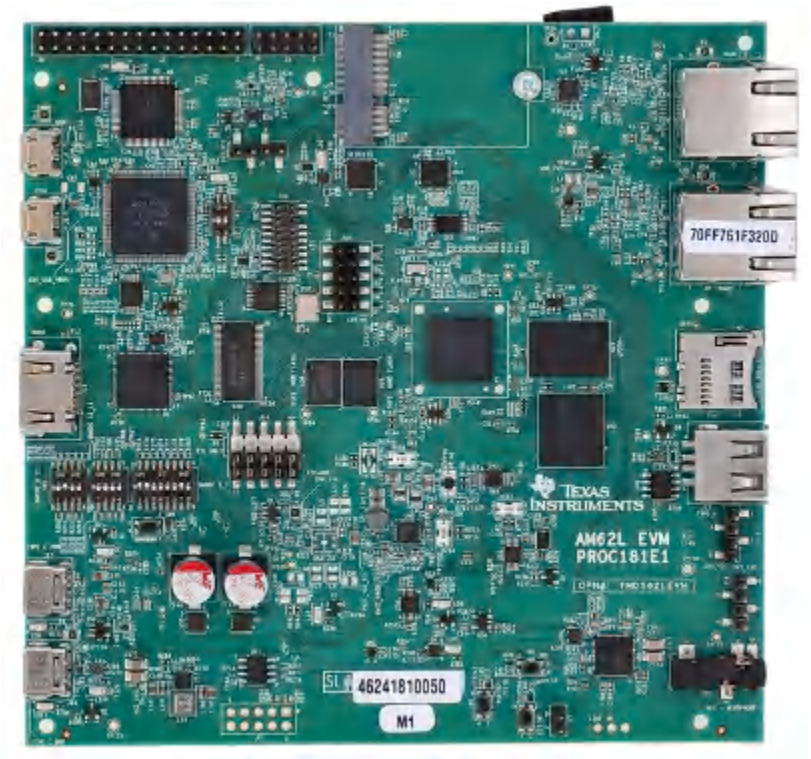

Figure 7. AM62L Evaluation Module

Third Party Ecosystems

We have partnered with several software and hardware vendors to create the TI Processors ecosystem. Please check out the *TI Partner Directory* to discover our partners to get to market faster.

Commonly Asked Questions

- *What operating systems are supported by the AM62L processor?* The AM62L processor supports multiple operating systems, including Linux and FreeRTOS.
- *How do I power the AM62L?* We have created a Power Management IC (PMIC), orderable part number *TPS65214*, to power applications using the AM62 processors.
- *What is the difference between the AM625 and AM62L?* The AM62L is a cost effective, performance optimized version of the AM625. AM625 has an M4F MCU subsystem as well as a 8 GFLOPS 3D GPU. The AM62L is designed for higher end HMI and 3D graphics acceleration. The device can be used in higher-end applications where more performance is needed.
- *If I start my design with the AM625 can I move to the AM62L? How about the AM67?* Yes, the AM62L, AM625, AM62P, and AM67 are software compatible. You can start your software development on the AM625 or AM67 and easily move to the AM62L.
- *How does the AM62L maintain data security?* The AM62L includes advanced security features such as secure boot, hardware encryption, and support for secure software updates, maintaining that data is protected from unauthorized access and tampering. Learn more about securing arm-based processors.
- *What development tools are available for the AM62L?* There is the *AM62L Academy*, and *TI Resource Explorer* for demos and application examples. These tools help streamline the development process and reduce time-to-market.
- *How to get started with AM62L Academy?* You can first visit the *AM62L Academy webpage*. Here, you can find a variety of training modules, tutorials, and resources that guide you through setting up and developing Linux-based applications on the AM62L processor. These resources are designed to help both beginners and experienced developers efficiently leverage the capabilities of the AM62L.
- *How to get demos?* Visit the *TI Resource Explorer (Tirex)*, which provides a wide range of demos, code examples, and application notes that showcase the processor capabilities in various use cases. The *Design Gallery* contains further demos to show the AM62L capabilities.

Table 1. AM62L Orderable Part Numbers

OPN	Description
AM62L32AOGHIANBR	2xA53 at 1.25GHz 125ºC
AM62L32AOGHAANBR	2xA53 at 1.25GHz 105ºC
AM62L32AEGHAANBR	2xA53 at 833MHz 105ºC
AM62L31AOGHAANBR	1xA53 at 1.25GHz 105ºC
AM62L31AEGHAANBR	1xA53 at 833MHz 105ºC

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