MYiR 米尔电子
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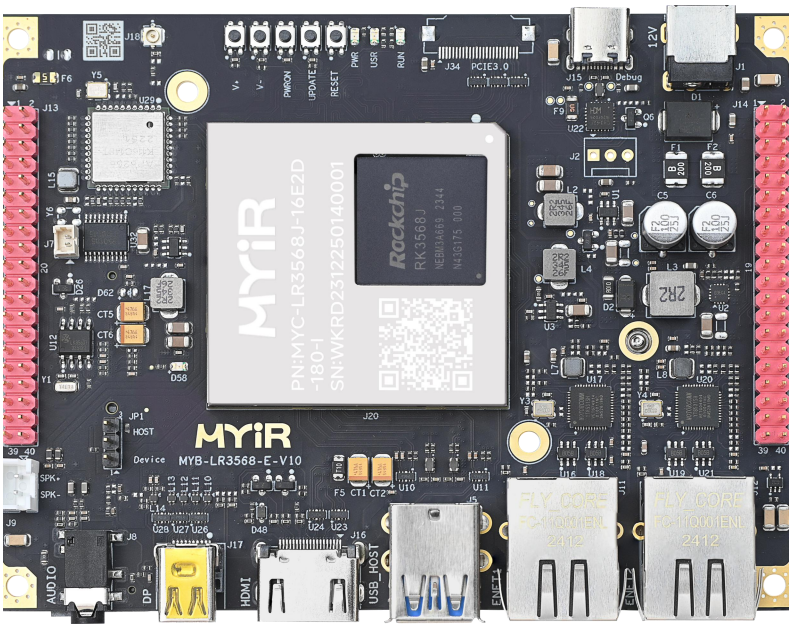
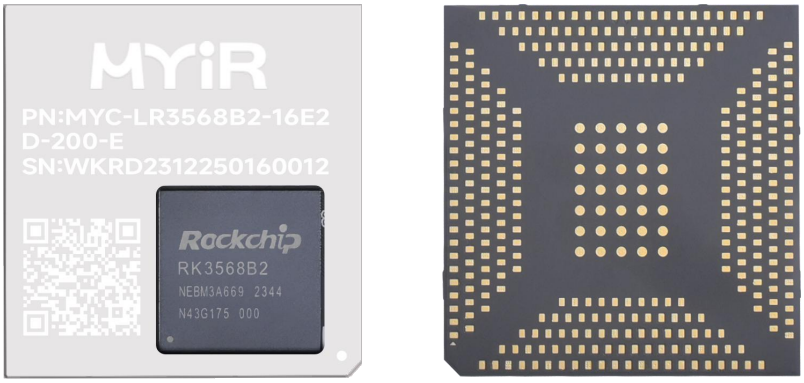
# MYD-LR3568
# Development Board
# Overview

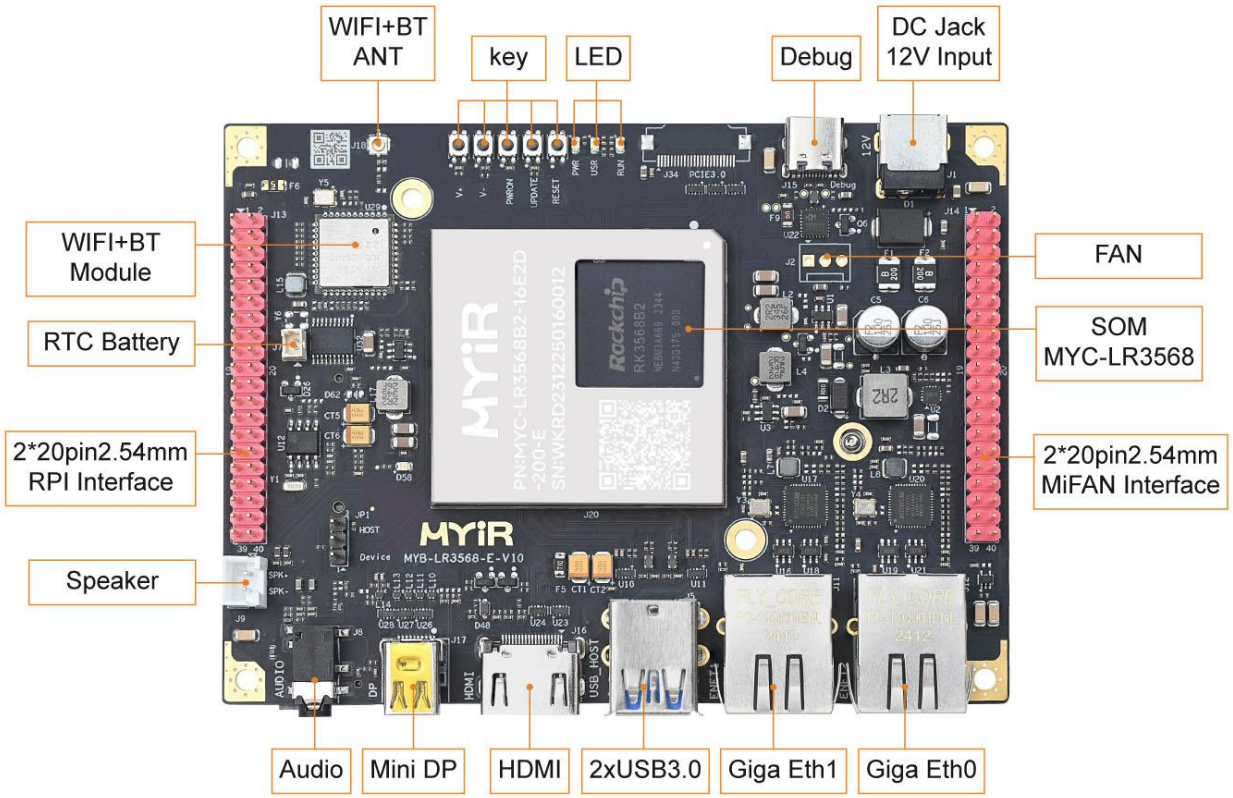

- ✓ *MYC-LR3568 SOM as Controller Board*
- ✓ *Rockchip RK3568 Application Processor based on Up to 2.0GHz Quad ARM Cortex-A55 Cores*
- ✓ *Neural Processing Unit (NPU) operating at up to 1 TOPs*
- ✓ *2GB LPDDR4, 16GB eMMC Flash, 32KB EEPROM*
- ✓ *2x USB 3.0, 1x USB 2.0, 2x Gigabit Ethernet, WIFI/Bluetooth, 2x CAN, Micro SD Card Slot, M.2 SSD PCIe Slot*
- ✓ *1x MIPI-CSI, HDMI/Mini-DP/MIPI-DSI/LVDS, Audio Interface*
- ✓ *Supports for Linux and Debian OS*
- ✓ *Optional 7-inch LCD Module, Camera Modules and RPI Module (RS232/RS485/CAN)*

The MYD-LR3568 Development Board is an advanced evaluation platform designed for the Rockchip RK3568 processor, which features up to 2.0GHz Quad ARM Cortex-A55 cores, providing various memory interfaces and enhancing the flexibility and convenience of the board to connect peripheral devices. The board supports for Linux and Debian OS, and it can withstand industrial working temperature range from -40 to 85 Celsius, or an extended range from -20 to 70 Celsius.

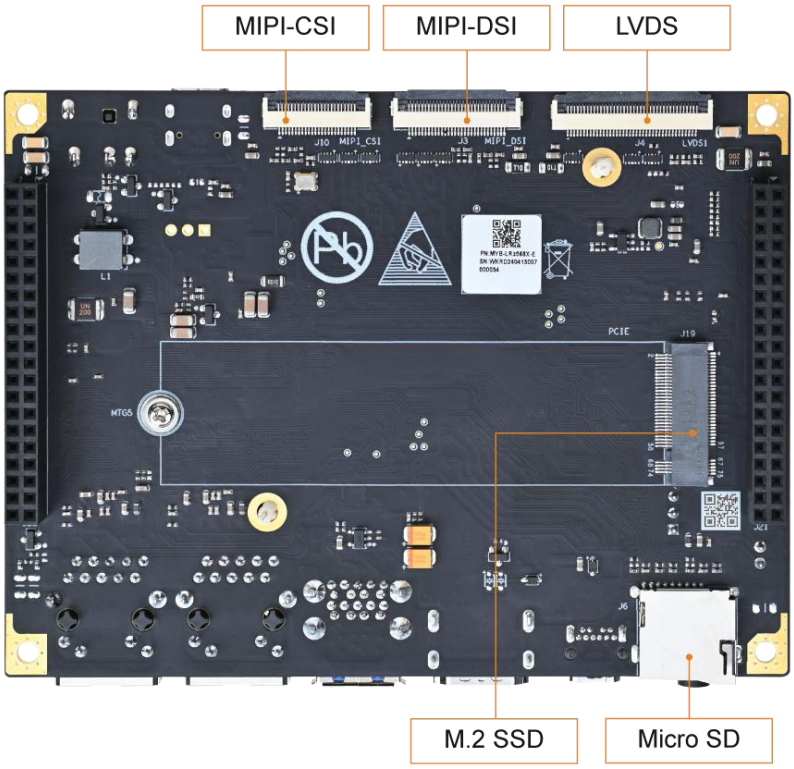
The MYD-LR3568 Development Board is built around the MYC-LR3568 System-On-Module (SOM) and has explored many features of the Rockchip RK3568 SoC through the 381-pin LGA expansion interface. This board is powered by 12V/3A DC power supply, equipped with two USB 3.0 ports, one USB 2.0 interface, dual Gigabit Ethernet interfaces, two CAN interfaces, and an integrated WiFi/Bluetooth module. Furthermore, it incorporates a Micro SD card slot and an M.2 NVMe SSD-compatible PCIe slot. The board also features a diverse set of multimedia interfaces, such as HDMI, Mini-DP, MIPI-DSI and LVDS display interfaces, along with a MIPI-CSI video input interface and audio capabilities. Moreover, the board offers flexibility for expansion through various peripheral signals accessible via the RPI Interface (GPIO/I2C/UART/SPI/CAN) and the MiFAN Interface (GPIO/I2C/UART/SPI/USB/PWM), enabling users to customize and enhance their development experience.




*MYC-LR3568 System-On-Module (Top-view and Bottom-view)*



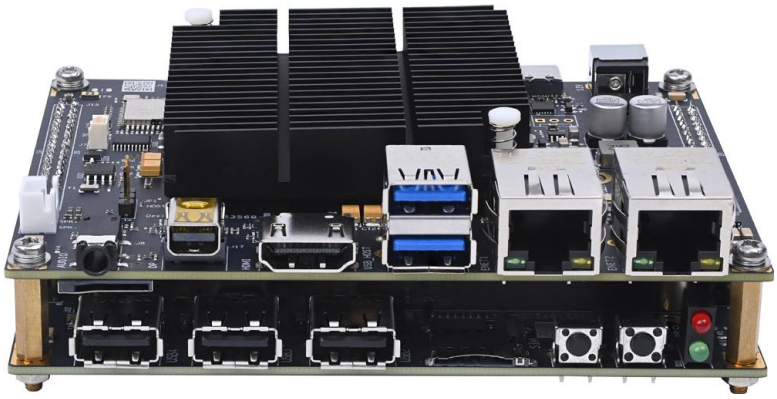

*MYD-LR3568 Development Board (Top view)*



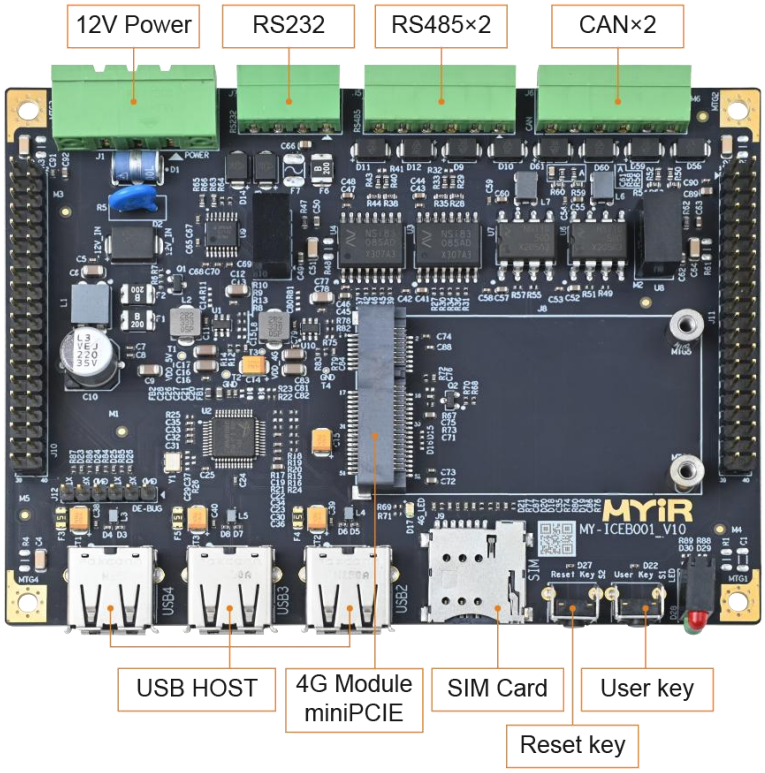

*MYD-LR3568 Development Board (Bottom view)*

The MYD-LR3568 Development Board is delivered with a Quick Start Guide, one USB Type-C cable and one 12V/3A power adapter. MYIR also offers MY-CAM004M 4AHD-to-MIPI Camera Module, MY-CAM005M MIPI Camera Module, MY-LVDS070C 7-inch LCD Module and MY-WIREDCOM RPI Module as add-on options for the board. The MYD-LR3568 with the RK3568J version also includes an expansion board MY-ICEB001 that extends three USB2.0 ports, one RS232 port, two RS485 port, two CAN interfaces and one M.2 Socket for a USB-based 4G/5G LTE Module with a SIM card holder. These enhancements significantly broaden the board's capabilities, enabling users to fulfill their unique project needs with versatility and flexibility.

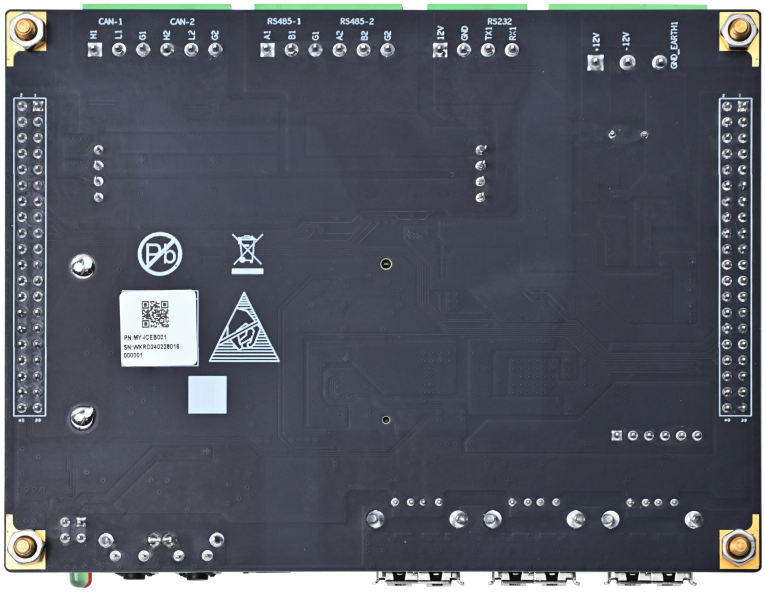
The MYD-LR3568 Development Board is capable of running Linux 5.10 and Debian 11 Operating Systems, ensuring a stable and efficient performance. MYIR provides abundant software resources, including kernel and driver source code, as well as detailed documentations and tools that facilitate rapid and easy development for users. These resources provide the necessary support to developers, enabling them to focus on creating innovative and exciting applications.



MYD-LR3568 (RK3568J version) with an expansion board MY-ICEB001




MY-ICEB001 Expansion Board Top-view (provided exclusively for MYD-LR3568 with RK3568J version)

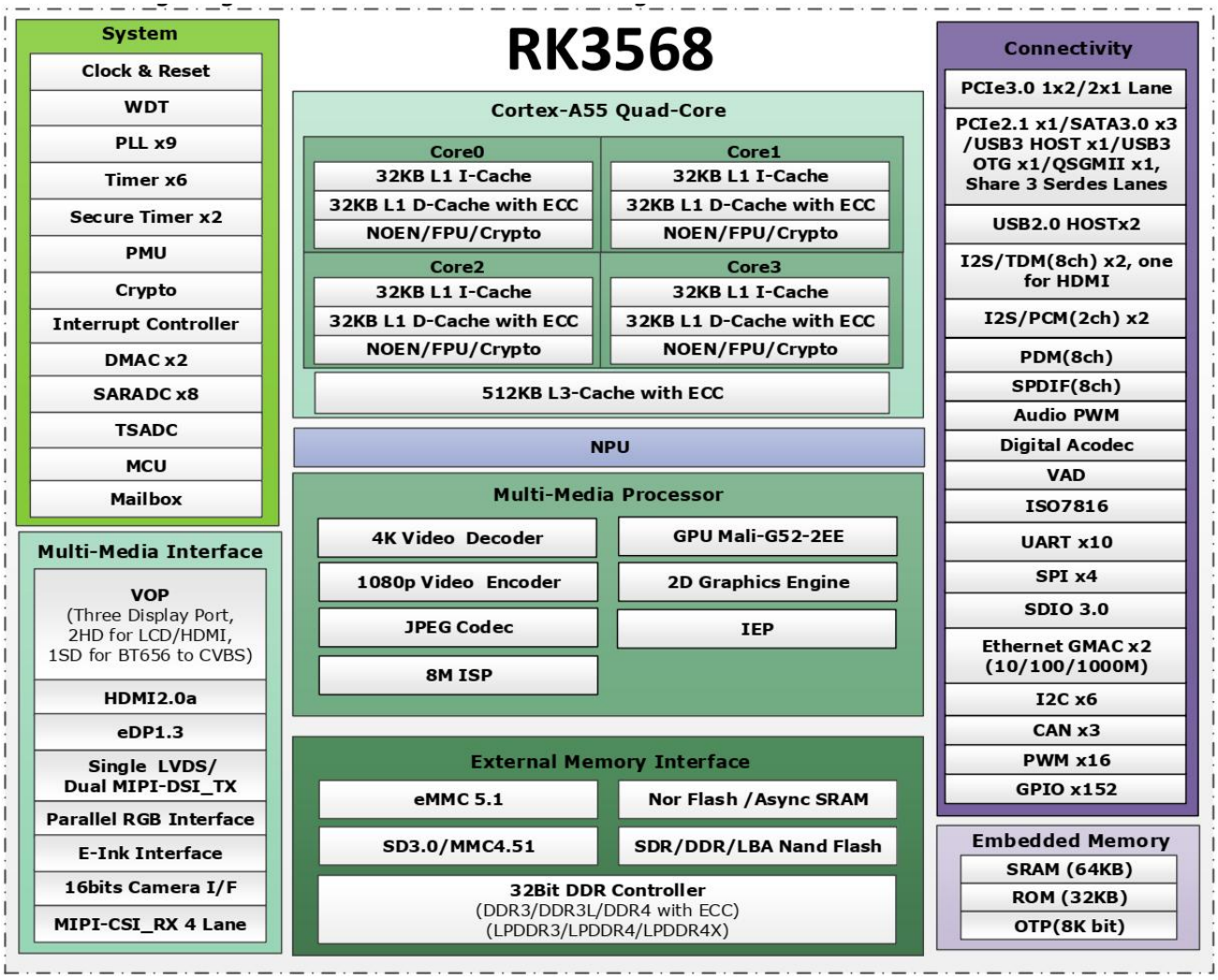


MY-ICEB001 Expansion Board Bottom-view (provided exclusively for MYD-LR3568 with RK3568J version)

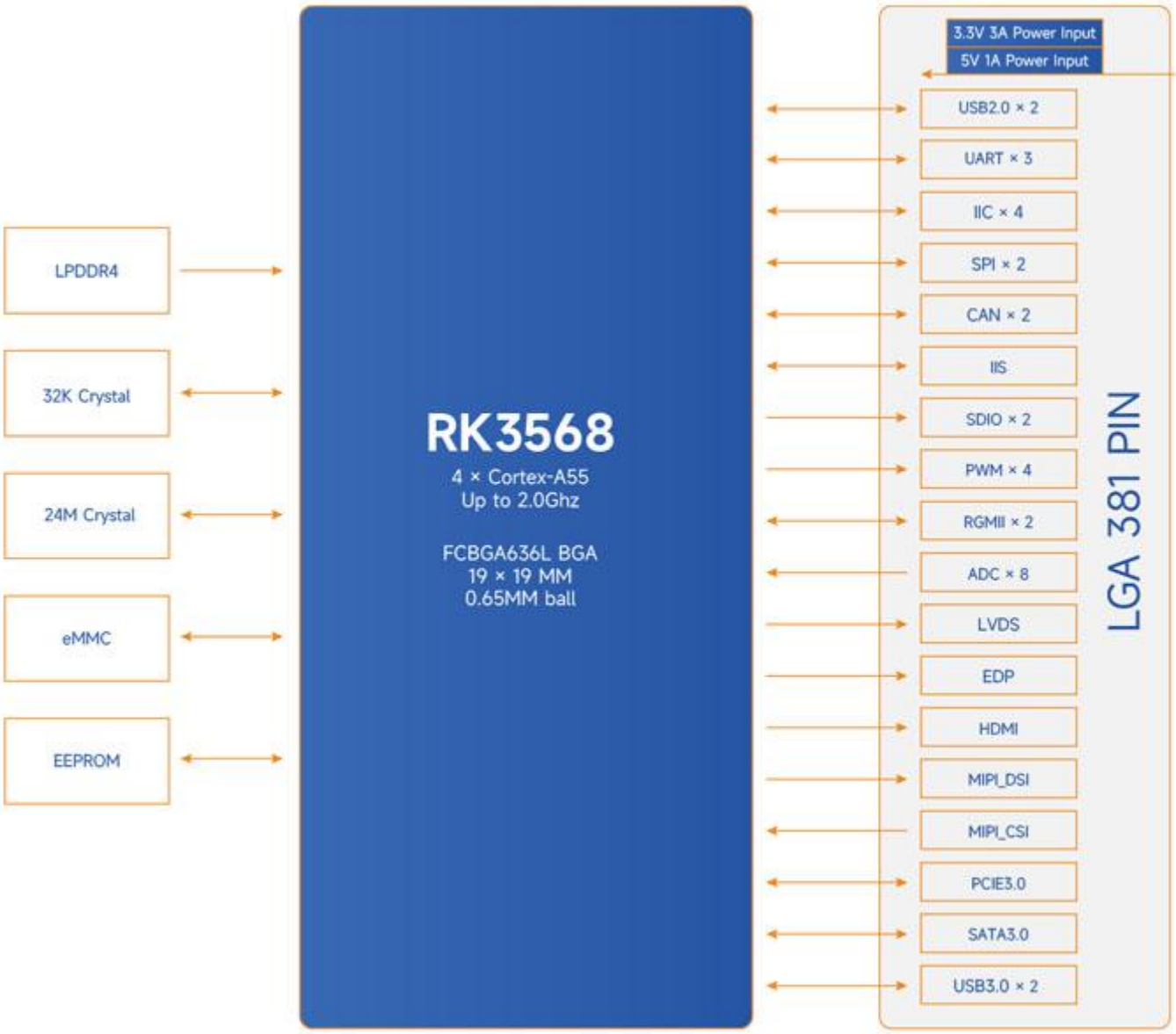
**Hardware Specification**

The RK3568 is a high-performance general-purpose SoC produced by Rockchip, which adopts an advanced 22nm process technology and integrates a 4-core ARM A55 processor and an advanced Mali G52 2EE graphics processor. It supports 4K decoding and 1080P encoding. Moreover, the RK3568 supports various types of peripheral interfaces such as SATA/PCIE/USB3.0, and has a built-in independent NPU that can be used for lightweight artificial intelligence (AI) applications. The RK3568 is targeted at a diverse range of applications, including IoT gateways, NVR storage, industrial control, HMI, cloud terminals, central vehicle controllers, and facial recognition systems. Its robust performance and feature set make it a reliable and versatile solution for these demanding applications.

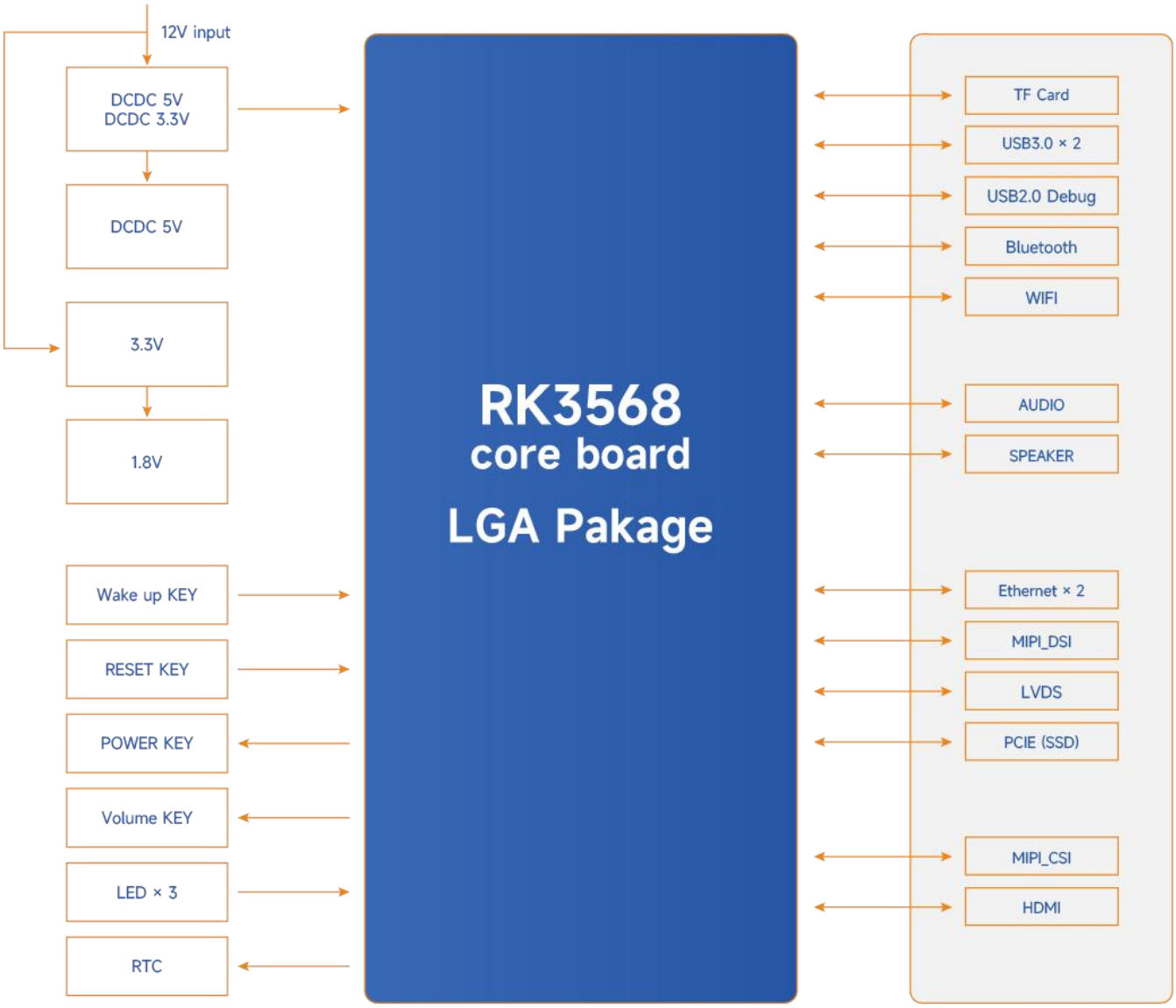
MYIR utilizes the RK3568B2 and RK3568J for its MYC-LR3568 System-on-Module. Both the RK3568B2 and RK3568J are fully compatible and share the same FCCSP636L package. The MYC-LR3568 equipped with the RK3568B2 supports an operating temperature range of -20 to 70 degrees Celsius, with a CPU clock speed reaching up to 2.0GHz. Meanwhile, the MYC-LR3568 featuring the RK3568J can operate within a temperature range of -40 to 85 degrees Celsius, and its CPU clock speed reaches up to 1.8GHz in overdrive mode.




*RK3568 Processor Block Diagram*




*MYC-LR3568 System-On-Module Function Block Diagram*




*MYD-LR3568 Development Board Function Block Diagram*

The MYD-LR3568 Development Board is using the MYC-LR3568 SOM as core controller board. It takes full features of Rockchip RK3568 processor and the main features are characterized as below:

**Mechanical Parameters**

- Dimensions: 90mm x 120mm (base board), 43mm x 45mm (SOM)
- PCB Layers: 6-layer design (base board), 12-layer design (SOM)
- Power supply: +12V/3A (base board); +5V/1A, 3.3V/3A (SOM)
- Working temperature: -40~85 Celsius (industrial grade) or -20~70 Celsius (extended temperature) (WiFi/BT Module: -30~85 Celsius)

## The MYD-LR3568 Controller Board (MYC-LR3568 SOM)

### Processor

- Rockchip RK3568 processor
  - Quad-core ARM Cortex-A55@2.0GHz (RK3568B2)/Quad-core ARM Cortex-A55@1.4GHz (RK3568J)
  (If you need RK3568J version at 1.8GHz in overdrive mode, please inquire MYIR.)
  - Arm Mali-G52 2EE GPU with support for OpenGL ES 1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1
  - Up to 1.0 TOPS NPU
  - Supports 4K 60fps H.265/H.264/VP9 Decoder and 1080P 60fps H.265/H.264 Encoder

### Memory

- 2GB LPDDR4 (supports 1GB/4GB/8GB)
- 16GB eMMC (supports 8GB/32GB)
- 32KB EEPROM

### Peripherals and Signals Routed to Pins

- Power Management IC
- 381-pin LGA Expansion Interface
  - 2x RGMII/RMII
  - 1x PCIe3.0, 1x 2 lane RC/EP, 2x 1 lane RC
  - 2x USB 2.0 Host
  - Multi-PHY (USB3.0 OTG/SATA0, USB3.0 Host/SATA1/QSGMII/SGMII, PCIe2.1/SATA2/QSGMII/SGMII)
  - SDIO (SDIO3.0/EMMC4.5.1, SDIO3.0)
  - 10x UART
  - 3x CAN2.0 a/b
  - 6x I2C
  - 15x PWM
  - 4x SPI
  - 8x SARADC, 10-bit
  - 1x DVP Camera Input, 16-bit
  - 1x MIPI-CSI, 4 lane/2+2 lane, 2.5Gbps
  - 1x HDMI2.0 (supports 4K@60fps/1080p@120fps)
  - 1x eDP1.3 (supports 2.5K@60fps)
  - 1x LVDS/Dual MIPI-DSI (supports 2.5Kp@60fps)
  - 1x Parallel RGB (supports 1080p@60fps)
  - 2x I2S/PCM, 8-channel
  - 1x I2S/PCM, 2-channel
  - 1x PDM, 8-channel
  - Up to 152x GPIOs

  *Note: the peripheral signals brought out to the expansion interface are listed in maximum number. Some signals are reused. Please refer to the processor datasheet and the SOM pinout description file.*

**The MYD-LR3568 Development Board Base Board**

- 1 x Power Jack
- 1 x Debug UART (USB Type-C connector)
- USB
  - 2x USB 3.0 Host (Type-A)
  - 1x USB 2.0 Host (via MiFAN expansion interface)
- 2x 10/100/1000Mbps Ethernet interfaces
- 1x WiFi/Bluetooth Module (complies with IEEE 802.11a/b/g/n/ac standard and supports BT 5.2)
- 2x CAN interfaces (via RPI expansion interface)
- 1x Micro SD card slot
- 1x M.2 NVME SSD PCIe slot
- 1x FAN socket
- 1x HDMI interface
- 1x Mini DP interface
- 1x MIPI-DSI interface
- 1x Single-channel 4 lane LVDS interface
  *Supports MYIR's MY-LVDS070C LCD Module with Capacitive Touch Screen*
- 1x MIPI-CSI Camera Interface
  *Support MYIR's MY-CAM004M 4AHD-to-MIPI Camera Module and MY-CAM005M MIPI Camera Modules*
- 1x 3.5mm Headphone/Mic Audio Jack
- 5x Buttons (Reset, Upload, Power, Volume+, Volume-)
- 2x Extension interfaces
  - RPI interface (2.45mm pitch 2x 20-pin male expansion header, GPIO/I2C/UART/SPI/CAN, compatible with Raspberry PI standard 40-pin extension interface)
  *Supports MYIR's MY-WIREDCOM RPI Module to extend RS485, RS232 and CAN functions*
  - MiFAN interface (2.45mm 2x 20-pin male expansion header, GPIO/I2C/UART/SPI/USB/PWM)

**Software Features**

The MYD-LR3568 development board offers supports for Linux and Debian OS and is equipped with comprehensive software packages. To assist clients in speeding up their projects, the kernel and numerous peripheral drivers are provided in source code format. Below is a brief overview of the key software feature:

| Item | Features | Description | Source Code |
|---|---|---|---|
| Bootloader | ATF | Switching and initialization of secure and non-secure environments | YES |
| | SPL | Initialize DDR, RTC, PMIC, and load the image into RAM | YES |
| | U-boot | Boot program uboot_2017.09 | YES |
| Linux kernel | Linux kernel | Customized base on official kernel_5.10.198 version | YES |
| Device driver | MMC | eMMC driver | YES |
| | USB Host | USB driver | YES |
| | I2C | I2C driver | YES |
| | SPI | SPI driver | YES |
| | Ethernet | Gigabit Ethernet driver | YES |
| | UART | RS232/RS485 Driver | YES |
| | CSI | MIPI Camera driver<br>Support MYIR's MY-CAM003M camera module (OV5640) | YES |
| | RTC | RTC driver | YES |
| | GPIO Key | Key driver | YES |
| | GPIO LED | LED driver | YES |
| | HDMI | HDMI driver | YES |
| | Touch | Touch screen driver | YES |
| | WIFI/Bluetooth | WIFI/BT driver | YES |
| | SOUND | Audio driver | YES |
| | LVDS | LVDS driver | YES |
| File system | myd-lr3568-core.img | Full-featured Linux image without GUI, built by buildroot | YES |
| | myir-image-Debian 11 | Compiled and constructed based on Debian 11 SDK | YES |

*MYC-LR3568 Software Features*

**Order Information**

<table>
<tr><th>Product Item</th><th>Part No.</th><th>Packing List</th></tr>
<tr><td rowspan="2">MYD-LR3568<br>Development Board</td><td>MYD-LR3568J-16E2D-180-I-GK</td><td>✓ One MYD-LR3568 Board (for RK3568J)<br>✓ One MY-ICEB001 Expansion Board<br>✓ One USB cable<br>✓ One 12V/3A Power adapter<br>✓ One Quick Start Guide</td></tr>
<tr><td>MYD-LR3568B2-16E2D-200-E</td><td>✓ One MYD-LR3568 Board (for RK3568B2)<br>✓ One USB cable<br>✓ One 12V/3A Power adapter<br>✓ One Quick Start Guide</td></tr>
<tr><td rowspan="2">MYC-LR3568<br>System-On-Module</td><td>MYC-LR3568J-16E2D-180-I</td><td rowspan="6">Add-on Options<br>✓ One MYC-LR3568 SOM<br>✓ MY-LVDS070C 7-inch LCD Module<br>✓ MY-CAM004M Camera Module<br>✓ MY-CAM005M Camera Module<br>✓ MY-WIREDCOM RPI Module</td></tr>
<tr><td>MYC-LR3568B2-16E2D-200-E</td></tr>
<tr><td>MY-LVDS070C<br>7-inch LCD Module</td><td>MY-LVDS070C</td></tr>
<tr><td>MY-CAM004M<br>4AHD-to-MIPI Camera Module</td><td>MY-CAM004M</td></tr>
<tr><td>MY-CAM005M<br>MIPI Camera Module</td><td>MY-CAM005M</td></tr>
<tr><td>MY-WIREDCOM RPI Module<br>(RS232/RS485/CAN)</td><td>MY-WIREDCOM</td></tr>
<tr><td colspan="3">Note:<br>1. One MYD-LR3568 Development Board comprises one MYC-LR3568 SOM mounted onto the base board. If you require additional SOMs, you may place orders for extras.<br>2. The RK3568J used can only work at 1.4GHz in normal mode. If you need RK3568J version at 1.8GHz in overdrive mode, please inquire MYIR.<br>3. Bulk discounts are available. For inquiries, kindly contact MYIR.<br>4. We cater to custom design requests based on the MYD-LR3568, whether it involves reducing, adding or modifying the existing hardware components to suit the customers' specific needs.</td></tr>
</table>

**MYIR Electronics Limited**

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