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## Document Directory Description

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In the Rockchip Linux SDK, the `docs` directory is divided into Chinese documentation ( `cn` ), English documentation ( `en` ), and license explanations ( `licenses` ), among others. The `licenses` directory contains the following:

```
licenses/  
├── BUILDROOT_README  
├── LICENSE  
└── manifest.csv
```

`LICENSE` is the document license declaration released by Rockchip. `manifest.csv` and `BUILDROOT_README` provide detailed explanations of the licenses for third-party packages compiled by default in the Buildroot system.

The documentation released with the Rockchip Linux SDK is intended to help developers get started quickly with development and debugging. The content in the documents does not cover all development knowledge and issues. The list of documents will also be continuously updated. If you have any questions or needs regarding the documentation, please contact our FAE window at [fae@rock-chips.com](mailto:fae@rock-chips.com).

In the Rockchip Linux SDK, the `docs` directory is divided into Chinese ( `cn` ) and English ( `en` ). The Chinese directory includes Common (general development guidance documents), Socs (chip platform-related documents), Linux (Linux system development-related documents), Others (other reference documents), and `docs_list_cn.txt` (the directory structure of the docs files). The specific introductions are as follows:

## 1. General Development Guidance Document (Common)

---

Please see the documentation in each subdirectory of `<SDK>/docs/cn/Common` for details.

## 1.1 Multicore Heterogeneous System Development Guide (AMP)

For details, see the `<SDK>/docs/cn/Common/AMP` directory. The multicore heterogeneous system is a general-purpose multicore heterogeneous system solution provided by Rockchip, which has been widely used in industrial applications such as power and industrial control, as well as consumer products like vacuum cleaners.

## 1.2 Peripheral Components Support List (AVL)

Please refer to `<SDK>/docs/cn/Common/AVL` directory for details, which contains the support list for DDR/eMMC/NAND FLASH/WIFI-BT/CAMERA. The support list is updated in real time on the redmine. The link is as follows:

<https://redmine.rockchip.com.cn/projects/fae/documents>

### 1.2.1 DDR Support List

For the Rockchip platform DDR chip support list, please refer to "Rockchip\_Support\_List\_DDR\_Ver2.56.pdf" in the `<SDK>/docs/cn/Common/AVL` directory. The following table shows the support level of DDR. It is only recommended to use chips marked with √ and T/A.

Table 1-1 Rockchip DDR Support Symbol

Symbol	Description
√	Fully Tested and Mass production
T/A	Fully Tested and Applicable
N/A	Not Applicable

### 1.2.2 eMMC Support List

The eMMC chip support list for Rockchip platform can be found in the `<SDK>/docs/cn/Common/AVL` directory in the document titled 'RKeMMCSupportList\_Ver1.77\_20230825.pdf'. It is recommended to choose chips marked with √ or T/A in the support level table below.

Table 1-2 Rockchip eMMC Support Symbol

Symbol	Description
√	Fully Tested , Applicable and Mass Production
T/A	Fully Tested , Applicable and Ready for Mass Production
D/A	Datasheet Applicable,Need Sample to Test
N/A	Not Applicable

- **Selection of High-Performance eMMC Chips**

To enhance system performance, it is necessary to choose high-performance eMMC chips. Before selecting an eMMC chip, please refer to the models in the support list provided by Rockchip and pay close attention to the **performance** section in the manufacturer's datasheet.

Please select eMMC chips based on the manufacturer's size specifications and the read/write speeds. It is recommended to choose chips with sequential read speeds >200MB/s and sequential write speeds >40MB/s.

If there are any doubts about selection, you can also directly contact the Rockchip FAE team [fae@rock-chips.com](mailto:fae@rock-chips.com).

#### 6.1.5 Performance

[Table 23] Performance

Density	Partition Type	Performance	
		Read(MB/s)	Write (MB/s)
16GB	General	285	40
32GB		310	70
64GB		310	140
128GB		310	140
16GB	Enhanced	295	80
32GB		320	150
64GB		320	245
128GB		320	245

Figure 1-1 eMMC Performance Example

### 1.2.3 SPI NOR and SLC NAND Flash Support List

The SPI NOR and SLC NAND Flash support list for Rockchip platform, can be found in the document titled "RK\_SpiNor\_and\_SLC\_Nand\_SupportList\_V1.44\_20230815.pdf" in the `<SDK>/docs/cn/Common/AVL` directory, the document also indicates the models of SPI NAND that can be selected. It is recommended to choose chips marked with √ or T/A in the support level table below.

Table 1-3 Rockchip SPI NOR and SLC NAND Support Symbol

Symbol	Description
√	Fully Tested , Applicable and Mass Production
T/A	Fully Tested , Applicable and Ready for Mass Production
D/A	Datasheet Applicable,Need Sample to Test
N/A	Not Applicable

### 1.2.4 NAND Flash Support List

Nand Flash support list for Rockchip platform, can be found in the `/docs/Common/AVL`` directory in the document titled "RKNandFlashSupportList Ver2.73\_20180615.pdf".the document also indicates the models of Nand Flash that can be selected. It is recommended to choose chips marked with √ or T/A in the support level table below.

Table 1-4 Rockchip Nand Flash Support Symbol

Symbol	Description
√	Fully Tested , Applicable and Mass Production
T/A	Fully Tested , Applicable and Ready for Mass Production
D/A	Datasheet Applicable,Need Sample to Test
N/A	Not Applicable

### 1.2.5 WIFI/BT Support List

WIFI/BT Support List for Rockchip Platform can be found in the document titled Rockchip\_Support\_List\_Linux\_WiFi\_BT\_20230531.pdf in the `<SDK>/docs/cn/Common/AVL` directory. This document contains a comprehensive list of WIFI/BT chips tested extensively on the Rockchip platform. It is advisable to select models based on the list. For the testing of other WIFI/BT chips, corresponding kernel drivers should be provided from the original manufacturers of the WIFI/BT chips.

For any questions about chip selection, it is recommended to contact the Rockchip FAE team at [fae@rock-chips.com](mailto:fae@rock-chips.com).

### 1.2.6 Camera Support List

Camera Support List for Rockchip Platform can be found in the [Camera Module Support List](#). This online list contains a comprehensive collection of Camera Modules extensively tested on the Rockchip platform. It is advisable to select models based on the list.

For any questions about module selection, it is recommended to contact the Rockchip FAE team at [fae@rock-chips.com](mailto:fae@rock-chips.com).

## 1.3 Audio Module Document (AUDIO)

It includes audio algorithms for microphones and relevant development documents for audio/Pulseaudio modules. The reference documents are as follows:

```
docs/cn/Common/AUDIO/
├─ Algorithms
├─ Rockchip_Developer_Guide_Audio_EN.pdf
└─ Rockchip_Developer_Guide_PulseAudio_EN.pdf
```

## 1.4 CAN Module Document (CAN)

CAN bus, also known as Controller Area Network, is an efficient serial communication network used for distributed control or real-time control. The following documents mainly cover CAN driver development, communication testing tools, common command interfaces, and frequently asked questions.

```
docs/cn/Common/CAN/  
├─ Rockchip_Developer_Guide_CAN_FD_EN.pdf  
└─ Rockchip_Developer_Guide_Can_EN.pdf
```

## 1.5 Clock Module Document (CLK)

This document primarily covers clock development on the Rockchip platform, including Clock, GPIO, PLL spreading, etc.

```
docs/cn/Common/CLK/  
├─ Rockchip_Developer_Guide_Clock_EN.pdf  
├─ Rockchip_Developer_Guide_Gpio_Output_Clocks_EN.pdf  
└─ Rockchip_Developer_Guide_Pll_Ssmod_Clock_EN.pdf
```

## 1.6 CRYPTO Module Document (CRYPTO)

The following documents primarily focus on the development of Rockchip Crypto and HWRNG (TRNG), including driver development and upper-layer application development.

```
docs/cn/Common/CRYPTO/  
└─ Rockchip_Developer_Guide_Crypto_HWRNG_EN.pdf
```

## 1.7 DDR Module Document (DDR)

This module document mainly includes DDR development guide, DDR issue troubleshooting, DDR chip validation process, DDR board layout instructions, DDR bandwidth tool usage, and DDR DQ eye diagram tool, etc. for Rockchip platform.

```
docs/cn/Common/DDR/  
├─ Rockchip_Developer_Guide-DDR-EN.pdf
```

## 1.8 Debug Module Document (DEBUG)

This module document mainly includes introduction to the use of debugging tools such as DS5, FT232H\_USB2JTAG, GDB\_ADB, Eclipse\_OpenOCD, etc. for Rockchip platform.

```
docs/cn/Common/DEBUG/  
├─ Rockchip_Developer_Guide_DS5_EN.pdf  
├─ Rockchip_Developer_Guide_FT232H_USB2JTAG.pdf  
├─ Rockchip_Developer_Guide_GDB_Over_ADB_EN.pdf  
└─ Rockchip_Developer_Guide_GNU_MCU_Eclipse_OpenOCD_EN.pdf
```

## 1.9 Display Module Document (DISPLAY)

This module document mainly includes development documents about DRM, DP, HDMI, MIPI, RK628 and other display modules for Rockchip platform.

```
docs/cn/Common/DISPLAY/  
├── DP  
├── HDMI  
├── MIPI  
├── RK628  
├── Rockchip_BT656_TX_AND_BT1120_TX_Developer_Guide_EN.pdf  
├── Rockchip_Developer_Guide_Baseparameter_Format_Define_And_Use_EN.pdf  
├── Rockchip_Developer_Guide_DRM_Display_Driver_EN.pdf  
├── Rockchip_Developer_Guide_RGB_MCU_EN.pdf  
├── Rockchip_Develop_Guide_DRM_Direct_Show_EN.pdf  
├── Rockchip_DRM_Panel_Porting_Guide_V1.6_20190228.pdf  
└── Rockchip_RK3588_Developer_Guide_MIPI_DSI2_EN.pdf
```

## 1.10 Dynamic Frequency and Voltage Adjustment Module Documentation (DVFS)

This module document primarily covers CPU/GPU/DDR and other dynamic frequency and voltage adjustment modules for Rockchip platform.

Cpufreq and Devfreq are a set of framework models defined by kernel developers that support dynamic frequency and voltage adjustment based on specified governors. It effectively reduces power consumption while balancing performance.

```
docs/cn/Common/DVFS/  
├── Rockchip_Developer_Guide_CPUFreq_EN.pdf  
└── Rockchip_Developer_Guide_Devfreq_EN.pdf
```

## 1.11 File System Module Documentation

This module document primarily includes the development documentation related to the file system on the Rockchip platform.

```
docs/cn/Common/FS/  
└── Rockchip_Developer_FAQ_FileSystem_EN.pdf
```

## 1.12 Ethernet Module Document (GMAC)

This module document primarily includes the development documentation related to the Ethernet GMAC interface on the Rockchip platform.



```
docs/cn/Common/GMAC/  
├─ Rockchip_Developer_Guide_Linux_GMAC_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_GMAC_DPDK_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_GMAC_Mode_Configuration_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_GMAC_RGMII_Delayline_EN.pdf  
└─ Rockchip_Developer_Guide_Linux_MAC_TO_MAC_EN.pdf
```

## 1.13 HDMI-IN Module Document (HDMI-IN)

This module document mainly contains development documents related to the HDMI-IN interface of the Rockchip platform.

```
docs/cn/Common/HDMI-IN/  
├─ Rockchip_Developer_Guide_HDMI_IN_Based_On_CameraHal3_EN.pdf  
└─ Rockchip_Developer_Guide_HDMI_RX_EN.pdf
```

## 1.14 I2C Module Document (I2C)

This module document mainly contains development documents related to I2C interface of the Rockchip platform.

```
docs/cn/Common/I2C/  
└─ Rockchip_Developer_Guide_I2C_EN.pdf
```

## 1.15 IO Power Domain Module Document (IO-DOMAIN)

In the Rockchip platform, IO voltages generally include 1.8V, 3.3V, 2.5V, 5.0V, etc. Some IO interfaces support multiple voltage levels. The io-domain is responsible for configuring the IO power domain registers. It configures the corresponding voltage registers based on the actual hardware voltage range. Without proper configuration, the IO interfaces cannot function correctly.

```
docs/cn/Common/IO-DOMAIN/  
└─ Rockchip_Developer_Guide_Linux_IO_DOMAIN_EN.pdf
```

## 1.16 IOMMU Module Document (IOMMU)

It mainly introduces the Rockchip platform IOMMU for converting 32-bit virtual addresses and physical addresses. It has read and write control bits and can generate page missing exceptions and bus exception interrupts.

```
docs/cn/Common/IOMMU/  
└─ Rockchip_Developer_Guide_Linux_IOMMU_EN.pdf
```

## 1.17 Image Module Document (ISP)

ISP1.X is mainly suitable for RK3399/RK3288/PX30/RK3326/RK1808, etc.

ISP21 is mainly suitable for RK3566\_RK3568, etc.

ISP30 is mainly suitable for RK3588, etc.

ISP32-lite is mainly suitable for RK3562, etc.

It contains ISP development documents, VI driver development documents, IQ Tool development documents, debugging documents and color debugging documents. The reference documents are as follows:

```
docs/cn/Common/ISP/
├─ ISP1.X
├─ ISP21
├─ ISP30
├─ ISP32-lite
└─ The-Latest-Camera-Documents-Link.txt
```

### Note:

Reference documents about RK3288/RK3399/RK3326/RK1808 Linux(kernel-4.4) rkisp1 driver, sensor driver, vcm driver is: "RKISP\_Driver\_User\_Manual\_v1.3\_20190919";

RK3288/RK3399/RK3326/RK1808 Linux(kernel-4.4) camera\_engine\_rkisp (3A repository) reference documents is: "camera\_engine\_rkisp\_user\_manual\_v2.0";

Reference document for IQ effect file parameters of RK3288/RK3399/RK3326/RK1808 Linux(kernel-4.4) camera\_engine\_rkisp v2.0.0 version v2.0.0 and above is:

"RKISP1\_IQ\_Parameters\_User\_Guide\_v1.0\_20190606".

## 1.18 MCU Module Document (MCU)

MCU development guide on the Rockchip platform.

```
docs/cn/Common/MCU/
└─ Rockchip_RK3399_Developer_Guide_MCU_EN.pdf
```

## 1.19 MMC Module Document (MMC)

Development guide for interfaces such as SDIO, SDMMC, and eMMC on the Rockchip platform.

```
docs/cn/Common/MMC/
├─ Rockchip_Developer_Guide_SDMMC_SDIO_eMMC_EN.pdf
└─ Rockchip_Developer_Guide_SD_Boot_EN.pdf
```

## 1.20 Memory Module Document (MEMORY)

Process memory module mechanisms such as CMA and DMABUF on the Rockchip platform.

```
docs/cn/Common/MEMORY/  
├─ Rockchip_Developer_Guide_Linux_CMA_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_DMABUF_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_Meminfo_EN.pdf  
└─ Rockchip_Developer_Guide_Linux_Memory_Allocator_EN.pdf
```

## 1.21 MPP Module Document (MPP)

MPP development instructions on the Rockchip platform.

```
docs/cn/Common/MPP/  
└─ Rockchip_Developer_Guide_MPP_EN.pdf
```

## 1.22 Watchdog Module Document (WATCHDOG)

Development instructions for Watchdog on the Rockchip platform.

```
docs/cn/Common/WATCHDOG/  
└─ Rockchip_Developer_Guide_Linux_WDT_EN.pdf
```

## 1.23 NPU Module Document (NPU)

The SDK provides RKNPU-related development tools, as follows:

### 1.23.1 RKNN-TOOLKIT2

RKNN-Toolkit2 is a development kit for generating and evaluating RKNN models on a PC:

The development kit is located in the `external/rknn-toolkit2` directory, primarily used for model conversion, optimization, quantization, inference, performance evaluation, and accuracy analysis, among other functions.

Basic functionalities include:

Function	Description
Model Conversion	Supports Pytorch / TensorFlow / TFLite / ONNX / Caffe / Darknet floating-point models Supports Pytorch / TensorFlow / TFLite Quantization Aware Models (QAT) Supports dynamic input models (Dynamicization/Native Dynamics) Supports large models
Model Optimization	Constant folding/ OP correction/ OP Fuse&Convert / Weight Sparsification/ Model Pruning
Model Quantization	Supports quantization types: Asymmetric i8/ fp16 Supports Layer / Channel quantization methods; Normal / KL/ MMSE quantization algorithms Supports mixed quantization for balancing performance and accuracy
Model Inference	Supports model inference on PC via emulator Supports transferring models to NPU hardware for inference (connected board inference) Supports inference in quantities and multi-input models
Model Evaluation	Supports performance and memory evaluation of models on NPU hardware
Accuracy Analysis	Supports quantization accuracy analysis (emulator/ NPU)
Additional Functions	Supports version/device query functions, etc.

For more detailed instructions, please refer to the current doc/ directory documents:

```

|— 01_Rockchip_RKNPU_Quick_Start_RKNN_SDK_V1.6.0_EN.pdf
|— 01_Rockchip_RKNPU_Quick_Start_RKNN_SDK_V1.6.0_EN.pdf
|— 02_Rockchip_RKNPU_User_Guide_RKNN_SDK_V1.6.0_EN.pdf
|— 02_Rockchip_RKNPU_User_Guide_RKNN_SDK_V1.6.0_EN.pdf
...
|— RKNN-Toolkit2_OP_Support-1.6.0.md

```

### 1.23.2 RKNN API

RKNN API development materials are located in the project directory `external/rknpu2`, which are used for inferring rknn models generated by RKNN-Toolkit2.

For more detailed instructions, please refer to the current doc/ directory documents:

```

...
|— 03_Rockchip_RKNPU_API_Reference_RKNN_Toolkit2_V1.6.0_EN.pdf
|— 03_Rockchip_RKNPU_API_Reference_RKNN_Toolkit2_V1.6.0_EN.pdf
|— 04_Rockchip_RKNPU_API_Reference_RKNNRT_V1.6.0_EN.pdf
|— 04_Rockchip_RKNPU_API_Reference_RKNNRT_V1.6.0_EN.pdf
|— 05_RKNN_Compiler_Support_Operator_List_v1.6.0.pdf
|— RKNN-Toolkit2_API_Difference_With_Toolkit1-1.6.0.md

```

## 1.24 NVM Module Document (NVM)

It mainly introduces the boot process on the Rockchip platform, configuring and debugging storage, OTP OEM area burning and other security interfaces.

```
docs/cn/Common/NVM/  
├─ Rockchip_Application_Notes_Storage_EN.pdf  
├─ Rockchip_Developer_FAQ_Storage_EN.pdf  
├─ Rockchip_Developer_Guide_Dual_Storage_EN.pdf  
└─ Rockchip_Developer_Guide_SATA_EN.pdf
```

## 1.25 PCIe Module Document (PCIe)

It mainly introduces the development instructions of PCIe on Rockchip platform.

```
docs/cn/Common/PCIe/  
├─ Rockchip_Developer_Guide_PCIe_EN.pdf  
├─ Rockchip_Developer_Guide_PCIe_EP_Standard_Card_EN.pdf  
├─ Rockchip_Developer_Guide_PCIe_Performance_EN.pdf  
├─ Rockchip_PCIe_Virtualization_Developer_Guide_EN.pdf  
└─ Rockchip_RK3399_Developer_Guide_PCIe_EN.pdf
```

## 1.26 Performance Module Document (PERF)

Introduction to PERF Performance analysis on Rockchip Platform

```
docs/cn/Common/PERF/  
├─ Rockchip_Develop_Guide_Linux_RealTime_Performance_Test_Report_EN.pdf  
├─ Rockchip_Optimize_Tutorial_Linux_IO_EN.pdf  
├─ Rockchip_Quick_Start_Linux_Perf_EN.pdf  
├─ Rockchip_Quick_Start_Linux_Performance_Analyse_EN.pdf  
├─ Rockchip_Quick_Start_Linux_Streamline_EN.pdf  
└─ Rockchip_Quick_Start_Linux_SysTrace_EN.pdf
```

## 1.27 GPIO Module Document (PINCTRL)

PIN-CTRL driver and DTS usage method on Rockchip platform.

```
docs/cn/Common/PINCTRL/  
└─ Rockchip_Developer_Guide_Linux_Pinctrl_EN.pdf
```

## 1.28 PMIC Module Document (PMIC)

Developer guide for PMICs such as RK805, RK806, RK808, RK809, and RK817 on the Rockchip platform.

```
docs/cn/Common/PMIC/
├─ Rockchip_RK805_Developer_Guide_EN.pdf
├─ Rockchip_RK806_Developer_Guide_EN.pdf
├─ Rockchip_RK808_Developer_Guide_EN.pdf
├─ Rockchip_RK809_Developer_Guide_EN.pdf
├─ Rockchip_RK816_Developer_Guide_EN.pdf
├─ Rockchip_RK817_Developer_Guide_EN.pdf
├─ Rockchip_RK818_Developer_Guide_EN.pdf
├─ Rockchip_RK818_RK816_Developer_Guide_Fuel_Gauge_EN.pdf
└─ Rockchip_RK818_RK816_Introduction_Fuel_Gauge_Log_EN.pdf
```

## 1.29 Power Module Document (POWER)

Basic concepts and optimization methods for chip power consumption on Rockchip platform.

```
docs/cn/Common/POWER/
└─ Rockchip_Developer_Guide_Power_Analysis_EN.pdf
```

## 1.30 PWM Module Document (PWM)

PWM developer guide on the Rockchip platform.

```
docs/cn/Common/PWM
└─ Rockchip_Developer_Guide_Linux_PWM_EN.pdf
```

## 1.31 RGA Module Document (RGA)

RGA developer guide on the Rockchip platform.

```
docs/cn/Common/RGA/
├─ Rockchip_Developer_Guide_RGA_EN.pdf
└─ Rockchip_FAQ_RGA_EN.pdf
```

## 1.32 SARADC Module Document (SARADC)

SARADC developer guide on the Rockchip platform.

```
docs/cn/Common/SARADC/
└─ Rockchip_Developer_Guide_Linux_SARADC_EN.pdf
```

## 1.33 SPI Module Document (SPI)

SPI developer guide on the Rockchip platform.

```
docs/cn/Common/SPI/  
└─ Rockchip_Developer_Guide_Linux_SPI_EN.pdf
```

## 1.34 Thermal Module Document (THERMAL)

Thermal developer guide on the Rockchip platform.

```
docs/cn/Common/THERMAL/  
└─ Rockchip_Developer_Guide_Thermal_EN.pdf
```

## 1.35 Tools Module Document (TOOL)

Instructions for using tools such as partitioning, mass production burning, and factory line burning on the Rockchip platform.

```
docs/cn/Common/TOOL/  
├─ Production-Guide-For-Firmware-Download.pdf  
├─ RKUpgrade_Dll_UserManual.pdf  
├─ Rockchip-User-Guide-ProductionTool-EN.pdf  
├─ Rockchip_Introduction_Partition_EN.pdf  
└─ Rockchip_User_Guide_Production_For_Firmware_Download_EN.pdf
```

## 1.36 Security Module Document (TRUST)

Introduction to functions such as TRUST and sleep & wake-up on the Rockchip platform

```
docs/cn/Common/TRUST/  
├─ Rockchip_Developer_Guide_Trust_EN.pdf  
├─ Rockchip_RK3308_Developer_Guide_System_Suspend_EN.pdf  
├─ Rockchip_RK3399_Developer_Guide_System_Suspend_EN.pdf  
├─ Rockchip_RK356X_Developer_Guide_System_Suspend_EN.pdf  
└─ Rockchip_RK3588_Developer_Guide_System_Suspend_EN.pdf
```

## 1.37 UART Module Document (UART)

Introduction to serial port functions and debugging on the Rockchip Platform

```
docs/cn/Common/UART/  
├─ Rockchip_Developer_Guide_UART_EN.pdf  
└─ Rockchip_Developer_Guide_UART_FAQ_EN.pdf
```

## 1.38 UBOOT Module Document (UBOOT)

Introduction to U-Boot related development on the Rockchip platform

```
docs/cn/Common/UBOOT/  
├─ Rockchip_Developer_Guide_Linux_AB_System_EN.pdf  
├─ Rockchip_Developer_Guide_U-Boot_TFTP_Upgrade_EN.pdf  
├─ Rockchip_Developer_Guide_UBoot_MMC_Device_Analysis_EN.pdf  
├─ Rockchip_Developer_Guide_UBoot_MTD_Block_Device_Design_EN.pdf  
├─ Rockchip_Developer_Guide_UBoot_Nextdev_EN.pdf  
└─ Rockchip_Introduction_UBoot_rkdevelop_vs_nextdev_EN.pdf
```

## 1.39 USB Module Document (USB)

Introduction to USB development guide, USB signal testing and debugging tools on the Rockchip platform

```
docs/cn/Common/USB/  
├─ Rockchip_Developer_Guide_Linux_USB_Initialization_Log_Analysis_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_USB_PHY_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_USB_Performance_Analysis_EN.pdf  
├─ Rockchip_Developer_Guide_USB2_Compliance_Test_EN.pdf  
├─ Rockchip_Developer_Guide_USB_EN.pdf  
├─ Rockchip_Developer_Guide_USB_FFS_Test_Demo_EN.pdf  
├─ Rockchip_Developer_Guide_USB_Gadget_UAC_EN.pdf  
├─ Rockchip_Developer_Guide_USB_SQ_Test_EN.pdf  
├─ Rockchip_Introduction_USB_SQ_Tool_EN.pdf  
├─ Rockchip_RK3399_Developer_Guide_USB_EN.pdf  
├─ Rockchip_RK3399_Developer_Guide_USB_DTS_EN.pdf  
├─ Rockchip_RK356x_Developer_Guide_USB_EN.pdf  
├─ Rockchip_RK3588_Developer_Guide_USB_EN.pdf  
├─ Rockchip_Trouble_Shooting_Linux4.19_USB_Gadget_UVC_EN.pdf  
└─ Rockchip_Trouble_Shooting_Linux_USB_Host_UVC_EN.pdf
```

## 2. Linux System Development Documents (Linux)

Please refer to documents under the `<SDK>/docs/cn/Linux` :

```
├─ ApplicationNote  
├─ Audio  
├─ Camera  
├─ Docker  
├─ Graphics  
├─ Multimedia  
├─ Profile  
├─ Recovery  
├─ Security  
├─ System  
├─ Uefi  
└─ Wifibt
```



## 2.1 ApplicationNote

Development instructions for applications on the Rockchip platform, such as ROS, RetroArch, USB, etc

```
docs/cn/Linux/ApplicationNote/  
├─ Rockchip_Developer_Guide_Linux_Flash_Open_Source_Solution_EN.pdf  
├─ Rockchip_Instruction_Linux_ROS2_EN.pdf  
├─ Rockchip_Instruction_Linux_ROS_EN.pdf  
├─ Rockchip_Quick_Start_Linux_USB_Gadget_EN.pdf  
└─ Rockchip_Use_Guide_Linux_RetroArch_EN.pdf
```

## 2.2 Audio Development Documents (Audio)

Self developed audio algorithm on Rockchip platform.

```
docs/cn/Linux/Audio/  
├─ Rockchip_Developer_Guide_Microphone_Array_TEST_EN.pdf  
├─ Rockchip_Developer_Guide_Microphone_Array_Tuning.pdf  
└─ Rockchip_Introduction_Linux_Audio_3A_Algorithm_EN.pdf
```

## 2.3 Camera Development Documents (Camera)

MIPI/CSI Camera and Structured Light Development Guide on the Rockchip Platform

```
docs/cn/Linux/Camera/  
├─ Rockchip_Developer_Guide_Linux4.4_Camera_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_RMSL_EN.pdf  
└─ Rockchip_Trouble_Shooting_Linux4.4_Camera_EN.pdf
```

## 2.4 Docker Development Documents (Docker)

Docker build and development of third-party systems such as Debian/Buildroot on the Rockchip platform.

```
docs/cn/Linux/Docker/  
├─ Rockchip_Developer_Guide_Debian_Docker_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_Docker_Deploy_EN.pdf  
└─ Rockchip_User_Guide_SDK_Docker_EN.pdf
```

## 2.5 Graphics Development Documents (Graphics)

Linux Graphics related development on Rockchip Platform.

```
docs/cn/Linux/Graphics/  
├─ Rockchip_Developer_Guide_Buildroot_Weston_EN.pdf  
└─ Rockchip_Developer_Guide_Linux_Graphics_EN.pdf
```

## 2.6 Multimedia

The general process of video encoding and decoding on the Rockchip Linux platform:

```
vpu_service --> mpp --> gstreamer/rockit --> app
vpu_service: driver
MPP: A video encoding and decoding middleware for the Rockchip platform. Please
refer to the MPP documentation for detailed instructions
Gstreamer/rockit: used to connect components such as apps
```

Currently, gstreamer is used in Debian/Buildroot systems by default to connect apps and codec components.

Currently, the key development documents are as follows:

```
docs/cn/Linux/Multimedia/
├─ Rockchip_Developer_Guide_Linux_RKADK_EN.pdf
├─ Rockchip_User_Guide_Linux_Gstreamer_EN.pdf
└─ Rockchip_User_Guide_Linux_Rockit_EN.pdf
```

Encoding and decoding functionalities can also be tested directly through the testing interfaces provided by MPP (such as `mpi_dec_test\mpi_enc_test...`). MPP source code reference is located in `<SDK>/external/mpp/`. For testing demos, please refer to `<SDK>/external/mpp/test`. Please refer to the SDK document `Rockchip_Developer_Guide_MPP_EN.pdf` for details.

Rockchip chips like RK3588 support powerful multimedia capabilities:

- Supports H.265/H.264/AV1/VP9/AVS2 video decoding, up to 8K60FPS, also supports 1080P multi-format video decoding (H.263, MPEG1/2/4, VP8, JPEG).
- Supports 8K H.264/H.265 video encoding and 1080P VP8, JPEG video encoding.
- Video post-processing: deinterlacing, noise reduction, edge/detail/color optimization.

Below are the reference specifications for common chip encoding and decoding capabilities on each platform.

**Note:** The maximum testing specifications are related to numerous factors, so the same decoding IP specifications might differ among different chips. Chip support may vary in different systems, leading to differences in supported formats and performance.

### • Decoding Capability Specification Table

Chip	H264	H265	VP9	JPEG
RK3588	7680X4320@30f	7680X4320@60f	7680X4320@60f	1920x1088@200f
RK3566/RK3568	4096x2304@60f	4096x2304@60f	4096x2304@60f	1920x1080@60f
RK3562	1920x1088@60f	2304x1440@30f	4096x2304@30f	1920x1080@120f
RK3399	4096x2304@30f	4096x2304@60f	4096x2304@60f	1920x1088@30f
RK3328	4096x2304@30f	4096x2304@60f	4096x2304@60f	1920x1088@30f
RK3288	3840x2160@30f	4096x2304@60f	N/A	1920x1080@30f
RK3326	1920x1088@60f	1920x1088@60f	N/A	1920x1080@30f
PX30	1920x1088@60f	1920x1088@60f	N/A	1920x1080@30f
RK312X	1920x1088@30f	1920x1088@60f	N/A	1920x1080@30f

- **Coding Capability Specification Table**

Chip	H264	H265	VP8
RK3588	7680x4320@30f	7680x4320@30f	1920x1088@30f
RK3566/RK3568	1920x1088@60f	1920x1088@60f	N/A
RK3562	1920x1088@60f	N/A	N/A
RK3399	1920x1088@30f	N/A	1920x1088@30f
RK3328	1920x1088@30f	1920x1088@30f	1920x1088@30f
RK3288	1920x1088@30f	N/A	1920x1088@30f
RK3326	1920x1088@30f	N/A	1920x1088@30f
PX30	1920x1088@30f	N/A	1920x1088@30f
RK312X	1920x1088@30f	N/A	1920x1088@30f

## 2.7 SDK Profile introduction (Profile)

Including software testing, benchmarks, etc. on Rockchip Linux platform.

```
docs/cn/Linux/Profile/  
├─ Rockchip_Developer_Guide_Linux_PCBA_EN.pdf  
├─ Rockchip_Introduction_Linux_Benchmark_KPI_EN.pdf  
├─ Rockchip_Introduction_Linux_PLT_EN.pdf  
└─ Rockchip_User_Guide_Linux_Software_Test_EN.pdf
```

## 2.8 OTA Upgrade (Recovery)

An introduction to the recovery development process and upgrade during OTA upgrade of Rockchip Linux platform.

```
docs/cn/Linux/Recovery/  
├─ Rockchip_Developer_Guide_Linux_DFU_Upgrade_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_Recovery_EN.pdf  
├─ Rockchip_Developer_Guide_Linux_Upgrade_EN.pdf  
└─ Rockchip_Introduction_Smart_Screen_OTA_EN.pdf
```

## 2.9 Security Solution (Security)

Introduction to the secure boot solution of Securoboot and TEE on Rockchip Linux platform

```
docs/cn/Linux/Security/  
├─ Rockchip_Developer_Guide_Linux_Secure_Boot_EN.pdf  
└─ Rockchip_Developer_Guide_TEE_SDK_EN.pdf
```

## 2.10 System Development (System)

Introduction to the porting and development guide for Debian and other third-party systems on the Rockchip Linux platform

```
docs/cn/Linux/System/  
├─ Rockchip_Developer_Guide_Buildroot_EN.pdf  
├─ Rockchip_Developer_Guide_Debian_EN.pdf  
└─ Rockchip_Developer_Guide_Third_Party_System_Adaptation_EN.pdf
```

## 2.11 UEFI Booting (UEFI)

Introduction to UEFI boot solution on Rockchip Linux platform.

```
docs/cn/Linux/Uefi/  
└─ Rockchip_Developer_Guide_UEFI_EN.pdf
```

## 2.12 Network Module (RKWIFIBT)

Introduction to the development of WIFI, BT, etc. on Rockchip Linux platform.

```
docs/cn/Linux/Wifibt/  
├─ AP module RF test document  
├─ REALTEK module RF test document  
├─ Rockchip_Developer_Guide_Linux_WIFI_BT_EN.pdf  
├─ WIFIBT programming interface  
└─ WIFI performance testing PC tool
```

## 2.13 DPDK Module (DPDK)

DPDK development guide on Rockchip Linux platform.

```
docs/cn/Linux/DPDK/  
└─ Rockchip_Developer_Guide_Linux_DPDK_EN.pdf
```

## 3. Chip Platform Related Documents (Socs)

---

Refer to the documentation in the `<SDK>/docs/cn/<chipset_name>` directory. Normally, it will include the release notes, quick start, software development guide, hardware development guide, Datasheet, etc.

## 3.1 Release Note

It contains an overview of the chip, supported main functions, instructions for obtaining the SDK, etc.

Reference document is in the `<SDK>/docs/cn/<chipset_name>` directory:

`Rockchip_<chipset_name>_Linux_SDK_Release_<version>_EN.pdf`

## 3.2 Quick Start

Normally, it will include software and hardware development guide, SDK build, SDK pre-build firmware, SDK burning, etc.

Please refer to the documentation in the `<SDK>/docs/cn/<chipset_name>/Quick-start` directory.

## 3.3 Software Development Guide

In order to help developers get familiar with the development and debugging of the SDK faster, the "Rockchip\_Developer\_Guide\_Linux\_Software\_EN.pdf" document can be obtained from the `/docs/cn/<chip_name>/` directory and will be continuously improved and updated.

## 4. Datasheet

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In order to help developers get familiar with chip development and debugging faster, a chip datasheet is released with the SDK.

Please refer to the documentation in the `<SDK>/docs/cn/<chipset_name>/Datasheet` directory.

### 4.1 Hardware Development Guide

Rockchip platform will have corresponding hardware reference documents released with the SDK software package. The hardware user guide mainly introduces the basic features, hardware interfaces, and usage methods of the reference hardware board. It aims to assist developers in using the EVB more quickly and accurately, and in developing related products. For more details, please refer to the documents in the

`<SDK>/docs/cn/<chip_name>/Hardware` directory.

## 5. Other Documents (Others)

---

For other reference documents, such as Repo mirror environment construction, Rockchip SDK application and synchronization guide, Rockchip Bug system usage guide, etc., please refer to the documents in the

`<SDK>/docs/cn/Others` directory.

```
docs/cn/Others/
```

```
|— Rockchip_Developer_Guide_Repo_Mirror_Server_Deploy_EN.pdf
|— Rockchip_Trouble_Shooting_Linux_Real-Time_Performance_EN.pdf
|— Rockchip_User_Guide_Bug_System_EN.pdf
└— Rockchip_User_Guide_SDK_Application_And_Synchronization_EN.pdf
```

## 6. Documents List (docs\_list\_cn.txt)

---

Please refer to the document in the /docs/cn/docs\_list\_cn.txt` directory.

```
|— Common
|— Linux
|— Others
|— Rockchip_Developer_Guide_Linux_Software_EN.pdf
|<chipset_name>
└— docs_list_cn.txt
```