HISILICON

HiMPP Startup Screen

User Guide

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About This Document

Purpose

This document provides the basic functions and U-boot command lines that are used to implement the startup screen function. Customers can configure the functions and command lines.

📖 **NOTE**

Unless otherwise specified, this document applies to the Hi3516A and Hi3516D.

Unless otherwise specified, the contents of Hi3518E V200 also apply to Hi3518E V201 and Hi3516C V200.

Related Versions

The following table lists the product versions related to this document.

Product Name	Version
Hi3516A	V100
Hi3516D	V100
Hi3518E	V200
Hi3518E	V201
Hi3516C	V200

Intended Audience

This document is intended for:

- Technical support engineers
- Software development engineers

Conventions

Symbol Conventions

The symbols that may be found in this document are defined as follows:

Symbol	Description
⚠ DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a hazard with a medium or low level of risk that, if not avoided, could result in minor or moderate injury.
⚠ CAUTION	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
⚏ TIP	Indicates a tip that may help you solve a problem or save time.
📖 NOTE	Provides additional information to emphasize or supplement important points of the main text.

Change History

Changes between document issues are cumulative. Therefore, the latest document issue contains all changes made in previous issues.

Issue 00B02 (2015-10-30)

This issue is the second draft release. which incorporates the following changes:

The description in section 1.1 is modified.

Issue 00B01 (2015-08-03)

This issue is the first draft release.

Contents

Tables

1 Overview

1.1 Function Description

The U-boot code has the following functions:

- Enables or disables the video output (VO) device in the U-boot environment. The Hi3516A supports the BT.656 and composite video broadcast signal (CVBS) interfaces and timings, whereas Hi3518E V200 supports only the BT.656 interfaces and timings.

- Enables or disables the VO graphics layer in the U-boot environment.

📖 **NOTE**

The JPEG decoding is not supported. Only the BMP picture with the pixel format of ARGB1555 is supported. The picture needs to be vertically flipped so that it can be normally displayed.

1.2 U-boot Command Lines

- startvo: starts the VO device.

  Parameters: device ID, interface type, and timing

  ```
  hisilicon # help startvo
  startvo - startvo  - open interface of vo device.
      - startvo [dev type sync]
  -<dev>: device ID. See Table 1-1.
  -<type>: interface type. See Table 1-1.
  -<sync>: timing type. See Table 1-1
  ```

- stopvo: stops the VO device.

  Parameter: device ID

  ```
  hisilicon # help stopvo
  stopvo - stopvo  - close interface of vo device.
      - stopvo [dev]
  - <dev>: device ID. See Table 1-1.
  ```

- startgx: enables the graphics layer.

Parameters: picture address (BMP picture in the ARGB1555 color format) and display position

```
hisilicon # help startgx

startgx - startgx  - open graphics layer.

    - startgx [addr x y]

-<addr>: picture address

-<x,y>: display position
```

- stopgx: disables the graphics layer.

  Parameter: None

```
hisilicon # help stopgx

stopgx - stopgx  - close graphics layer.

    - stopgx [void]
```

- setvobg: sets the background color of the device.

  Parameter: graphics layer

```
hisilicon # help setvobg

setvobg - setvobg  - set vo background color.

    - setvobg [dev color]

-<dev>: device ID. See Table 1-1.

-<color>: rgb color space
```

Table 1-1 Chip differences

Chip	Device	Type	Sync
Hi3516A	0	1 (CVBS), 8 (BT.656)	0 (PAL), 1 (NTSC)
Hi3518E V200	0	8 (BT.656)	0 (PAL), 1 (NTSC)

1.3 U-boot Functions

The following functions are provided for encoding under the U-boot:

- startvo

```
int start_vo(unsigned int dev, unsigned int type, unsigned int sync);
```

📖 **NOTE**

Only the device with the device ID listed in Table 1-1 is supported.

- stopvo

```
int stop_vo(unsigned int dev);
```

- strartgx

```
int start_gx(unsigned addr, unsigned int x, unsigned int y);
```

📖 **NOTE**

> This address is the start address of the BMP picture with the pixel format of ARGB1555. The picture needs to be vertically flipped so that it can be normally displayed.

- stopgx

```
int stop_gx(void);
```

- setvobg

```
int set_vobg(unsigned int dev, unsigned int rgb);
```

📖 **NOTE**

> - Calling this function takes effect only before startvo is called. If you call this function after calling startvo, the calling operation takes effect when startvo is called again.
> - It is recommended that the RGB color format be set to 0xRRGGBB, which makes pictures clearer.

1.4 New Code or Modified Code

Only the basic functions relevant to the startup screen are provided. You can configure these functions based on the actual applications.

```
Makefile-osd
arch/arm/lib/cache-cp15.c
arch/arm/lib/mmu.s
include/hi35xx_vo.h
include/configs/hi35xx.h
common/cmd_vo_hi35xx.c
common/Makefile-osd
common/cmd_dec.c
common/Makefile
product/hiosd/vo/hi35xx/
Makfile vou.c  vou_coef.h vou_coef_org.c vou_coef_org.h vou_def.h vou_drv.c
vou_drv.h   vou_hal.c vou_hal.h vou_reg.h hi_type.h
```

1.5 Samples of Command Lines

The following describes the command lines for configuring the PAL output of the CVBS interface:

- **startvo 0 1 0**: start the VO device.
- **startgx 0x94000000 0 0**: enable the graphics layer.
- **stopgx**: disable the graphics layer.
- **stopvo 0**: stop the VO device.