

TCCXXXX SPLASH PARTITION IMAGE DISPLAY GUIDE

TCCxxxx_Android 4.4.2(Kitkat-mr1.1)_v1.00E_How to use splash partition image

Rev. 1.00

Mar 28, 2014

Telechips

DISCLAIMER

All information and data contained in this material are without any commitment, are not to be considered as an offer for conclusion of a contract, nor shall they be construed as to create any liability. Any new issue of this material invalidates previous issues. Product availability and delivery are exclusively subject to our respective order confirmation form; the same applies to orders based on development samples delivered. By this publication, Telechips, Inc. does not assume responsibility for patent infringements or other rights of third parties that may result from its use.

Further, Telechips, Inc. reserves the right to revise this publication and to make changes to its content, at any time, without obligation to notify any person or entity of such revisions or changes.

No part of this publication may be reproduced, photocopied, stored on a retrieval system, or transmitted without the express written consent of Telechips, Inc.

This product is designed for general purpose, and accordingly customer be responsible for all or any of intellectual property licenses required for actual application. Telechips, Inc. does not provide any indemnification for any intellectual properties owned by third party.

Telechips, Inc. can not ensure that this application is the proper and sufficient one for any other purposes but the one explicitly expressed herein. Telechips, Inc. is not responsible for any special, indirect, incidental or consequential damage or loss whatsoever resulting from the use of this application for other purposes.

COPYRIGHT STATEMENT

Copyright in the material provided by Telechips, Inc. is owned by Telechips unless otherwise noted.

For reproduction or use of Telechips' copyright material, permission should be sought from Telechips. That permission, if given, will be subject to conditions that Telechips' name should be included and interest in the material should be acknowledged when the material is reproduced or quoted, either in whole or in part. You must not copy, adapt, publish, distribute or commercialize any contents contained in the material in any manner without the written permission of Telechips. Trade marks used in Telechips' copyright material are the property of Telechips.

Important Notice

For customers who use licensed Codec ICs and/or licensed codec firmware of mp3:

"Supply of this product does not convey a license nor imply any right to distribute content created with this product in revenue-generating broadcast systems (terrestrial, Satellite, cable and/or other distribution channels), streaming applications(via internet, intranets and/or other networks), other content distribution systems(pay-audio or audio-on-demand applications and the like) or on physical media(compact discs, digital versatile discs, semiconductor chips, hard drives, memory cards and the like). An independent license for such use is required. For details, please visit <http://mp3licensing.com>".

For customers who use other firmware of mp3:

"Supply of this product does not convey a license under the relevant intellectual property of Thomson and/or Fraunhofer Gesellschaft nor imply any right to use this product in any finished end user or ready-to-use final product. An independent license for such use is required. For details, please visit <http://mp3licensing.com>".

For customers who use Digital Wave DRA solution:

"Supply of this implementation of DRA technology does not convey a license nor imply any right to this implementation in any finished end-user or ready-to-use terminal product. An independent license for such use is required."

For customers who use DTS technology:

"This product made under license to certain U.S. patents and/or foreign counterparts."
"© 1996 – 2011 DTS, Inc. All rights reserved."

For customers who use Dolby technology:

"Supply of this Implementation of Dolby technology does not convey a license nor imply a right under any patent, or any other industrial or intellectual property right of Dolby Laboratories, to use this Implementation in any finished end-user or ready-to-use final product. It is hereby notified that a license for such use is required from Dolby Laboratories."

For customers who use MS technology:

"This product is subject to certain intellectual property rights of Microsoft and cannot be used or distributed further without the appropriate license(s) from Microsoft."

Revision History

Date	Version	Description
2014-03-28	1.00	Initial release

TABLE OF CONTENTS

Contents

1 Introduction	1-5
2 Splash Partition For Logo Display	2-5
3 The structure of splash image.....	3-5
4 How to configure for using splash partition.	4-6
4.1 Change lk bootloader settings	4-6
5 How to make splash image.....	5-7
5.1 Structure of mkssplashimg.sh.....	5-7
6 How to download splash image to splash partition	6-9
6.1 Use SD/MMC or NAND V8 FTL only for Splash partition.....	6-9
6.2 Fastboot mode download.....	6-9
7 How to display the splash image in bootloader.....	7-10

1 Introduction

This document describes how to configure splash partition for displaying logo images

2 Splash Partition For Logo Display

Now we support splash partition for save and display logo image in bootloader. Previously we used header file which include bitmap images. because the bitmap image in header file, the bootloader size is big. So the bootloader loading time is long.

This document describe the structure of splash image and how to configure and use splash image in splash partition And it explain example using tcc893x platform

3 The structure of splash image

The Splash image consist of two parts. the one is splash header which contain the image information and other is bitmap images.

1. Header contains RAW image information like image name, start addr, size, width and height
2. Image is the RAW Data of Bitmap Image.

Header	SPLASH TAG		Number of Image	Reserved
	Image name (1)			
	Start Addr	Size	width	heigh
	Padding	Reserved		
			
	Image name (n)			
	Start Addr	Size	width	heigh
	Padding	Reserved		
Images	RAW IMAGE 1			
			
	RAW IMAGE n			

<Structure of Splash Image>

4 How to configure for using splash partition.

4.1 Change lk bootloader settings

The following is how to set bootloader for a boot logo by using a splash image. The bootloader image made in the following procedure should be downloaded to a board.

```
$ cd ~/mydroid/android  
$ vi bootable/bootloader/lk/target/tcc893x_evm/rules.mk
```

```
181 # Define Default Splash  
182 DEFINES += DISPLAY_SPLASH_SCREEN  
183 #DEFINES += DISPLAY_SPLASH_SCREEN_DIRECT
```

5 How to make splash image

The splash partition patch include the script to make splash image. before using this script, the convert utility has to be installed on your build system. the steps as below.

1. Configure the splash image in device/telechips/tcc893x/Boardconfig.mk

```
#Splash Image generate
TARGET_BOARD_SPLASH_USE := true
```

5.1 Structure of mk splashimg.sh

2. Build Android system then you can get the mk splashimg script for making splash image. the mk splashimg is below (device/Telechips/common/splash)

```
# !bin/sh

for ((idx=0; idx<$NIMG; idx++));
do
#IMG_ORI[$idx]=$(cat ${PARAMS[$idx+2]})
IMG_ORI[$idx]=$(cat ${PARAMS[$idx+3]})
IMG_EXT[$idx]=$(cat ${IMG_ORI[$idx]%%.*}.tmp)
IMG_FN[$idx]=$(cat ${IMG_ORI[$idx]%%.*}.img)

IMG_RSL[$idx]=$(identify "${IMG_ORI[$idx]}" | cut -f 3 -d' ')

IMG_BITS[$idx]=$(file "${IMG_ORI[$idx]}" | cut -f 11 -d' ')

#convert image
if [ "$FMTSIZE" -eq "32" ]; then
convert -depth 8 ${IMG_ORI[$idx]} rgb:${IMG_EXT[$idx]}
rgbtob24 <${IMG_EXT[$idx]}> ${IMG_FN[$idx]}
else if [ "$FMTSIZE" -eq "16" ]; then
convert -depth 8 ${IMG_ORI[$idx]} rgb:${IMG_EXT[$idx]}
rgbtob24 <${IMG_EXT[$idx]}> ${IMG_FN[$idx]}
else
echo "ERROR : [ choose fmt 16 or 32] "
usage
fi
fi

done

echo ${IMG_RSL[*]}
echo ${IMG_BITS[*]}

MK_SPLASH="mk splash $PAGESIZE $NIMG ${IMG_FN[*]} ${IMG_RSL[*]} $FILENAME"
echo $MK_SPLASH
$MK_SPLASH
```

3. The mkspalshimg script need the argument for making splash image
 - A. Pagesize – for nand flash memory. (MTD : pagesize , **SD/MMC:512** , **FTL(NAND_v8):512**)
 - B. Number of image – the number of image that include splash image. it can *contains maximum 10 images*.
 - C. Target bitmap images - the image format have to bitmatp(bmp) and the resolution is same as you want to display.
 - D. Target out file – the final splash partition image.

Examples.

```
# when set to 32bit display output

$mkspalshimg 8192 32 2 bootlogo.bmp test.bmp splash.img //nand
$mkspalshimg 512 32 2 bootlogo.bmp test.bmp splash.img //EMMC

# when set to 16bit display output

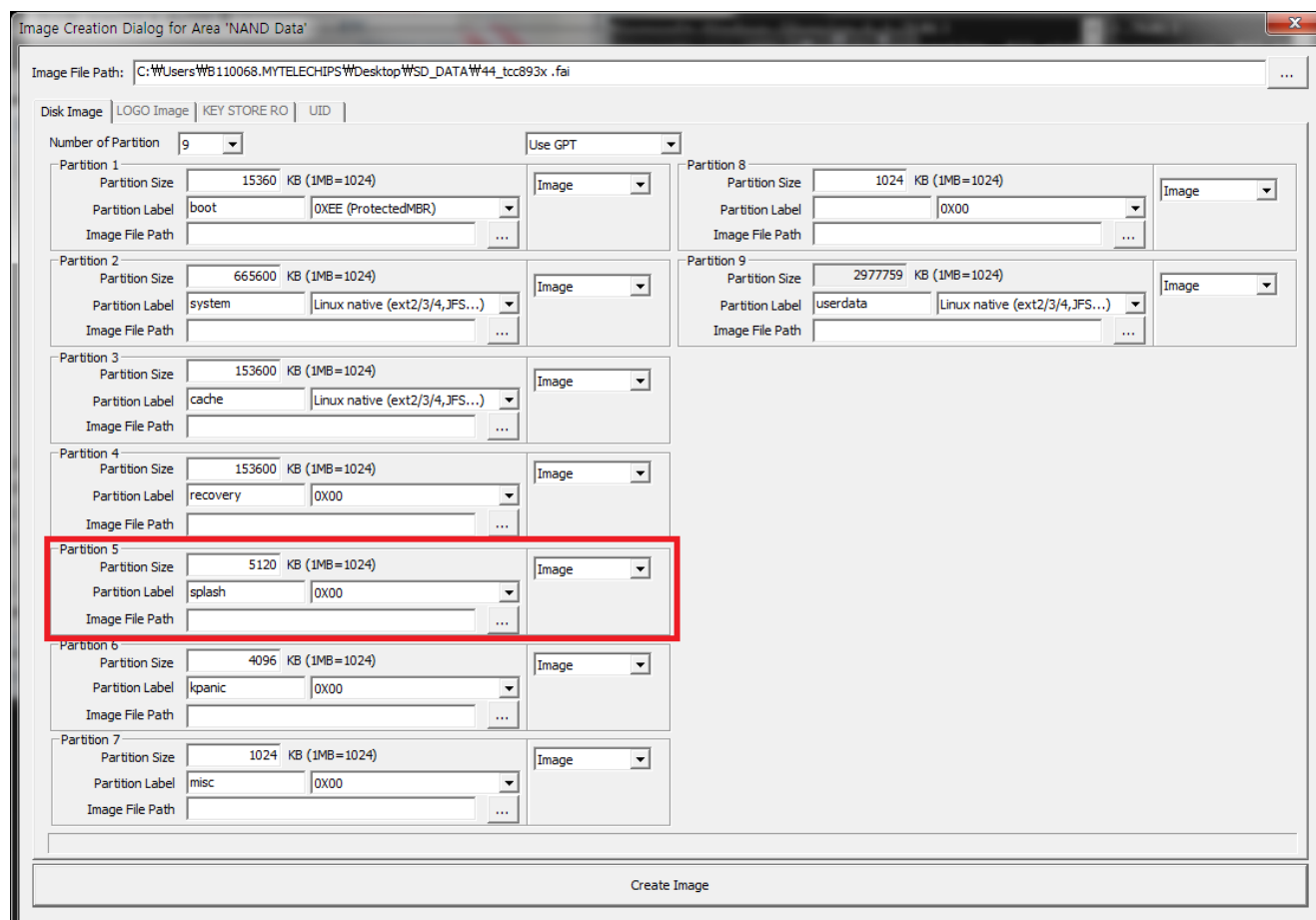
$mkspalshimg 8192 16 2 bootlogo.bmp test.bmp splash.img //nand
$mkspalshimg 512 16 2 bootlogo.bmp test.bmp splash.img //EMMC
```


6 How to download splash image to splash partition

if you make splash image completely, then you can download the image to target splash partition.

6.1 Use SD/MMC or NAND V8 FTL only for Splash partition.

If you use the sd/mmc or nand version 8 driver for splash partition, you can download splash image using fwn. The red box is splash image partition. Add the splash image when you make partition using fwn.



6.2 Fastboot mode download

The fastboot mode download is are same both of MTD and SD/MMC

```
$ fastboot flash splash {splsh image}
```

7 How to display the splash image in bootloader

After applying splash partition patch. If you want to display the specific images, you can simply call the function named `splash_image()` with argument of image name. the image name is the name of bitmap file.

(ex. `mksplashing 8192 16 1 bootlogo_480x272.bmp splash.img`)

For example. the bitmap file name is `bootlogo.bmp`, you can call that function like `splash_image_load("bootlogo_480x272", fb_config)`. The name is added in splash image headers.

Example code (bootable/bootloader/lk/target/tcc893x_evm/target_display.c)

```
void display_init(void)
{
    uint32_t hw_id = 0 ;//board_hardware_id();
    //    uint32_t soc_ver = board_soc_version();

    dprintf(INFO, "display_init(),target_id=%d.\n", hw_id);
    #if (1)
        fb_config = lcdc_init();
        ASSERT(fb_config);
        fbcon_setup(fb_config);

    #if !defined(DISPLAY_SPLASH_SCREEN_DIRECT)
        dprintf(INFO, "Splash Display int: start\n");
        splash_image_load("bootlogo_480x272", fb_config);
        display_splash_logo(fb_config);
        dprintf(INFO, "Splash Display int: end\n");
    #endif

    .....
}
```