



LX -TI DM8148

Technical Documentation

SPI Boot Guide

09/10/2012

Document version :	1.0
Date :	09/10/2012
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LX TI DM8148 SPI Boot Guide

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In order to support high capacity eMMC (above 2GB), SPI ROM is necessary as the default boot device on LX TI DM8148. The two boot loaders (x-loader and u-boot) should be flashed to SPI ROM and the “boot.scr” and linux kernel should still be placed at the first FAT32 partition of eMMC.

1. Enable SPI ROM support for LX TI DM8148

The SPI ROM on LX TI DM8148 is SST25VF080B/PCT25VF080B. And we provide the patches to support SPI ROM function:

- rdk10b_spi-boot_uboot.patch
- rdk10b_spi-boot_kernel.patch
- spi_boot.patch

If you use the source from RDK1.0 beta, please refer to the first two patches. Otherwise please use “spi_boot.patch” to update you r source code.

2. Build Boot Loaders

Please refer the following instructions to compile x-loader and u-boot for SPI boot.

Building x-loader:

```
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm distclean make  
CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm \  
ti8148_evm_min_spi  
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm u-boot.ti
```

Building u-boot:

```
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm distclean make  
CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm \  
ti8148_evm_config_spi  
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm u-boot.ti
```

If you use the u-boot source from RDK1.0 beta (under TI NDA only), please use below instructions instead:

Building x-loader:

```
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm distclean make  
CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm \  
ti8148_d500_min_spi  
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm u-boot.ti
```

Building u-boot:

```
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm distclean make  
CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm \  
ti8148_d500_config_spi  
make CROSS_COMPILE=arm-none-linux-gnueabi- ARCH=arm u-boot.ti
```

3. Flashing to SPI ROM

Here we introduce two methods to flash boot loaders to SPI ROM: flashing at u-boot or flashing at linux userspace.

3.1. Flashing at u-boot

Before you start the flashing procedure, please copy x-loader and u-boot files (i.e. u-boot.min.spi/MLO.spi and u-boot.bin) to eMMC FAT32 partition. Otherwise you can also copy these files to micro SD card and insert it into the micro SD slot on LX TI DM8148. Then boot up LX TI DM8148 to u-boot stage by UART boot method and refer the following steps to flash boot loaders to SPI ROM.

Step1. Check eMMC/micro SD and SPI ROM status.

General version:

```
mmc init  
sf probe 0:0
```

RDK1.0 beta version:

```
mmc rescan 0 sf  
probe 0:0
```

Step2. Load x-loader and u-boot from eMMC/micro SD.

General version:

```
mmc init
mw.b 0x81000000 0xFF 0x20000
fatload mmc 1 0x81000000 u-boot.min.spi mw.b 0x81020000 0xFF
0x40000
fatload mmc 1 0x81020000 u-boot.bin
```

RDK1.0 beta version:

```
mmc rescan 0
mw.b 0x81000000 0xFF 0x20000
fatload mmc 0 0x81000000 u-boot.min.spi mw.b 0x81020000 0xFF
0x40000
fatload mmc 0 0x81020000 u-boot.bin
```

Step3. Flash x-loader and u-boot to SPI ROM.

```
sf probe 0:0
sf erase 0x0 0x20000
sf write 0x81000000 0x0 0x20000 sf erase 0x20000 0x40000
sf write 0x81020000 0x20000 0x40000
```

3.2. Flashing at Linux Userspace

Please install “mtd-utils” package by below command first and then you can R/W SPI ROM at userspace through “mtd_debug” command.

```
sudo apt-get install mtd-utils
```

Step1. Check 2 MTD blocks on SPI ROM.

```
sudo su  
mtdinfo /dev/mtd0  
mtdinfo /dev/mtd1
```

Step2. Erase SPI ROM first.

```
mtd_debug erase /dev/mtd0 0x0 0x20000  
mtd_debug erase /dev/mtd1 0x0 0x40000
```

Step3. Flash x-loader and u-boot to SPI ROM.

```
mtd_debug write /dev/mtdblock0 0x0 <len1> u-boot.min.spi  
mtd_debug write /dev/mtdblock1 0x0 <len2> u-boot.bin
```

PS. <len1> is byte length of x-loader and <len2> is byte length of u-boot. **Step4.** Read contents of SPI ROM and compare with source files.

```
mtd_debug read /dev/mtdblock0 0x0 <len1> u-boot.min.spi.tmp  
mtd_debug read /dev/mtdblock1 0x0 <len2> u-boot.bin.tmp cksum u-  
boot.min.spi u-boot.min.spi.tmp  
cksum u-boot.min.spi u-boot.min.spi.tmp
```

4. Reference Links

1. DM814x AM387x PSP U-Boot

http://processors.wiki.ti.com/index.php/DM814x_C6A814x_AM387x_PSP_U-Boot

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