

# JF4418 USERS GUIDE

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## [Table of Contents](#)

1. INTRODUCTION.....	2
1.1 WHAT IS JF4418?.....	2
1.2 FEATURES.....	2
1.3 BOARD PHYSICAL DIMENSION.....	3
1.4 BOARD COMPONENT DESCRIPTION.....	4
1.4.1 TOP VIEW.....	4
1.4.2 BOTTOM VIEW.....	5
1.5 BOARD IO HEADER DESCRIPTION.....	6
2. SOFTWARE INSTALLATION GUIDE.....	7
2.1 DISK PARTITION INFORMATION.....	7
2.2 BUILD ENVIRONMENT REQUIREMENT.....	7
2.3 INSTALL LINUX BY USING PREBUILT IMAGE.....	8
2.4 INSTALL LINUX BY USING SOURCE CODE.....	8
2.5 BOOTING THE LINUX.....	9
2.5.1 FIRST BOOT SETTINGS.....	9
2.5.1 LINUX SETTINGS.....	10

# **1. INTRODUCTION**

## **1.1 WHAT IS JF4418?**

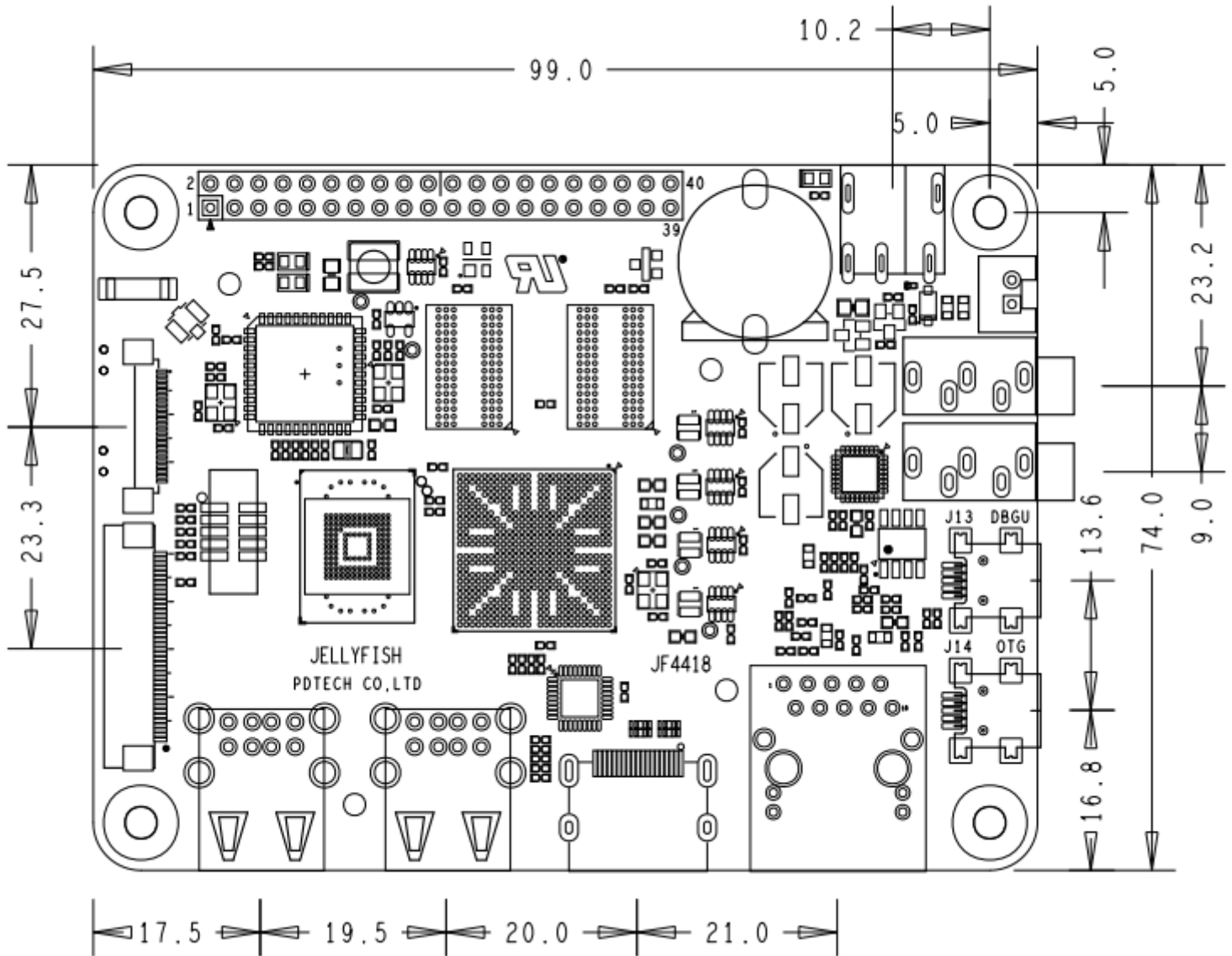
JF4418 is a high performance single board computer (SBC) which is able to run many open source OS such as Debian, Ubuntu, Android 5.0 Lollipop... Based on ARM cortex-A9 processor, JF4418 is powerful development board for software development and easy to use. This uses guide describes information about JF4418 SBC and shows how to build and deploy and run Linux on it.

## **1.2 FEATURES**

- CPU S5P4418 ARM Cortex-A9 1.4GHz.
- RAM 1GB DDR3 800MHz.
- eMMC (option).
- Micro SD Card.
- WIFI 802.11 b/g/n + Bluetooth BLE 4.0 combo module inside.
- USB 2.0 host x 4 ports.
- USB OTG for Android debugging.
- USB to COM for system console.
- Gigabit ETH port.
- TFT LCD 24bit RGB interface.
- HDMI 1.4a Full HD 1080p support.
- CSI Camera sensor input.
- Audio HP, MIC in, speaker out ports.
- GPIO Header.
- 5V DC power supply input.

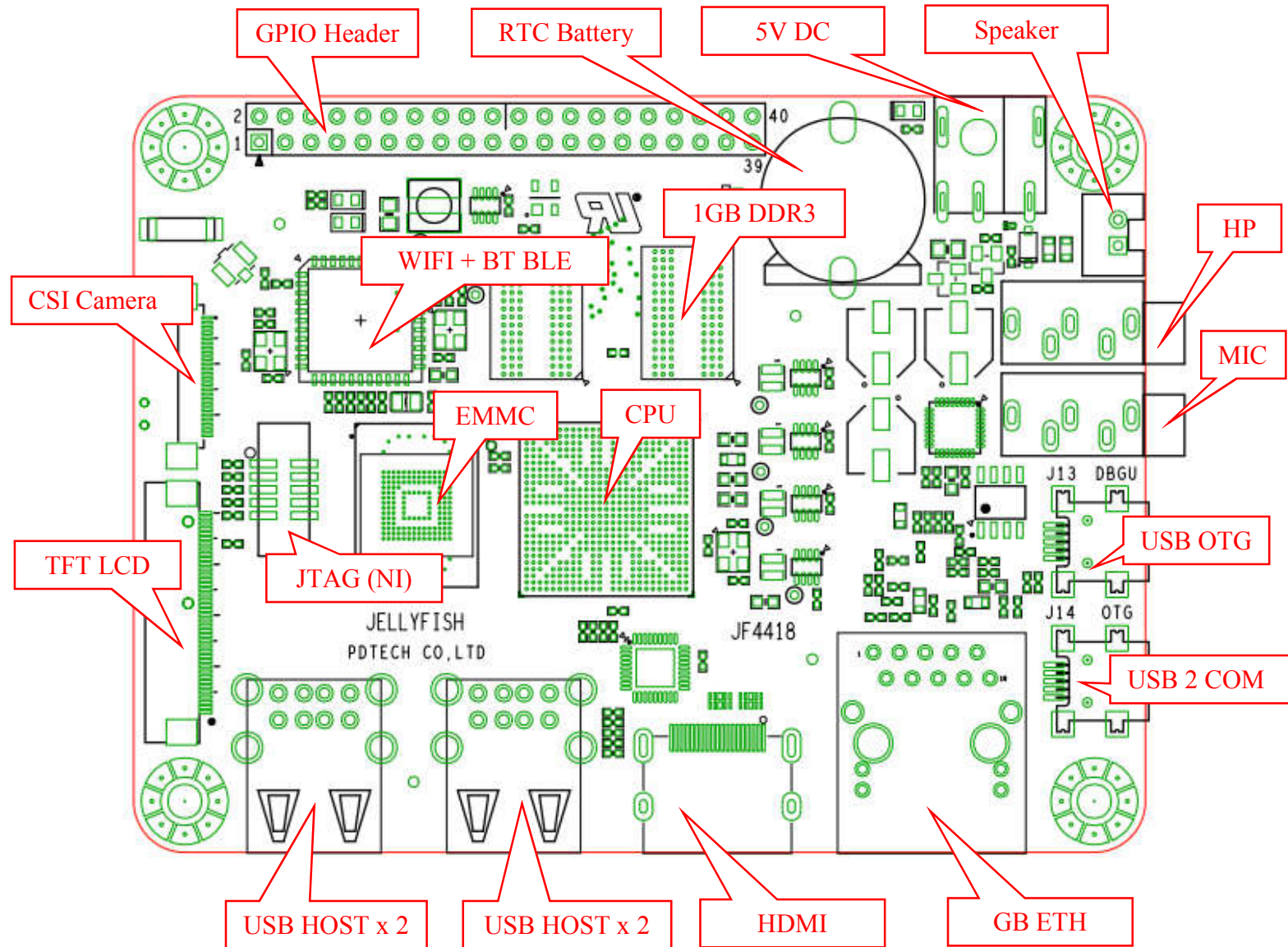
## 1.3 BOARD PHYSICAL DIMENSION

JF4418 board dimension (mm) as the following image:



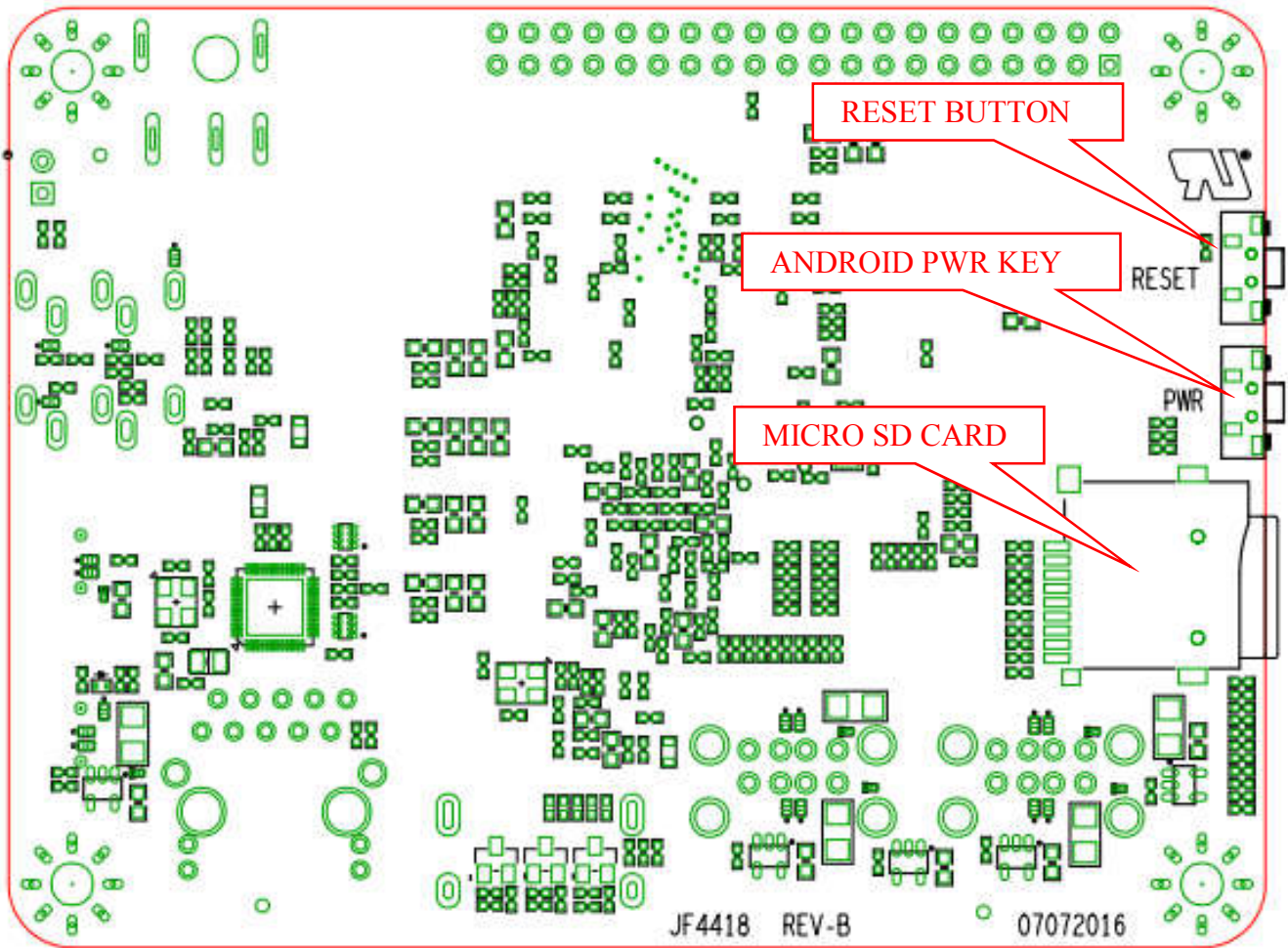
## 1.4 BOARD COMPONENT DESCRIPTION

### 1.4.1 TOP VIEW

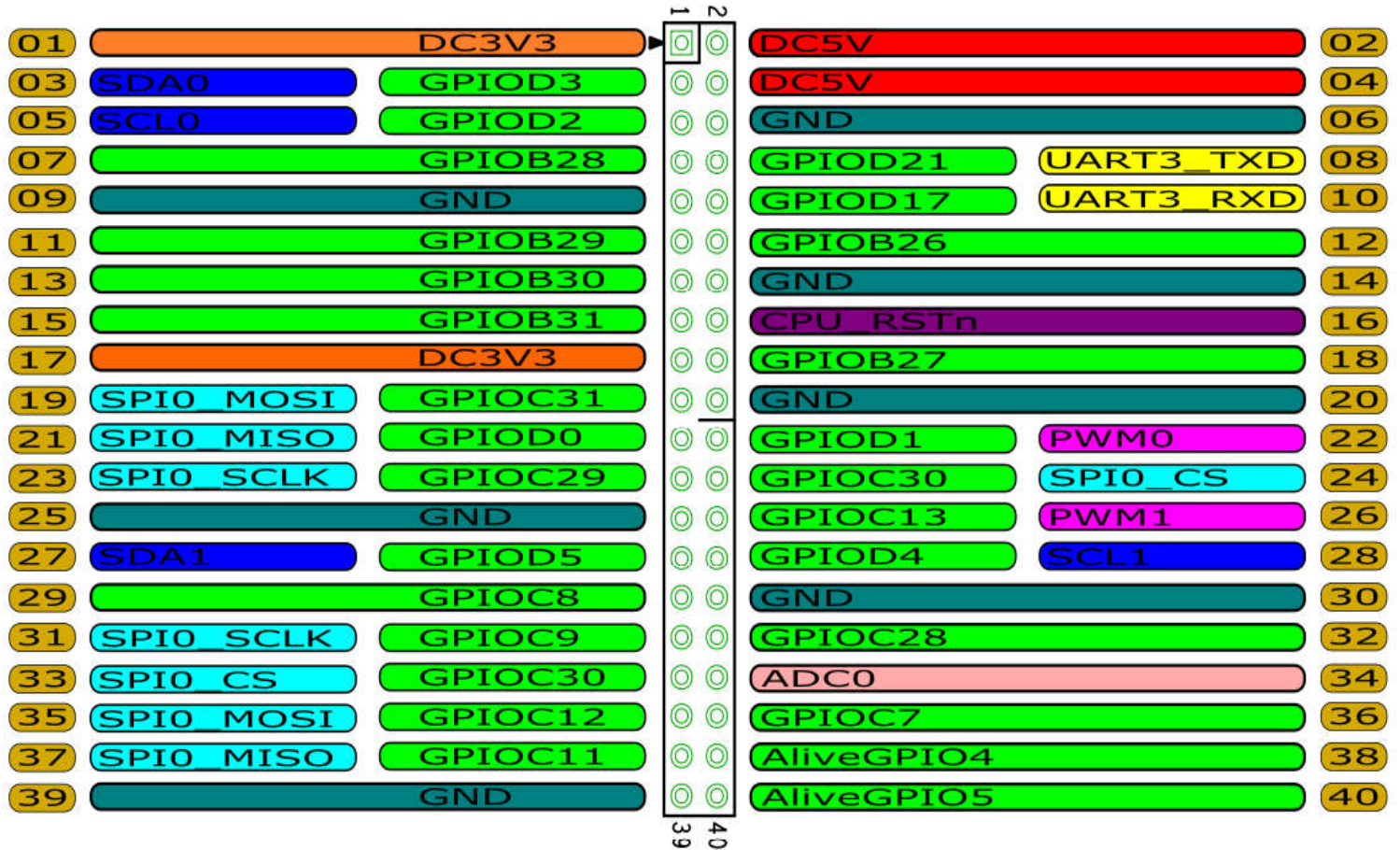




#### 1.4.2 BOTTOM VIEW



## 1.5 BOARD IO HEADER DESCRIPTION



GPIO high level 3.3V

GPIO low level 0V

DC3V3 is regulated voltage output, maximum current ~ 2A (includes on board components)

DC5V is 5V over voltage protected output, maximum current ~3.4A depends on IRML6401 MOSFET.

## **2. SOFTWARE INSTALLATION GUIDE**

### **2.1 DISK PARTITION INFORMATION**

JF4418 can boot Linux via micro SC card, partition of disk drive as bellow table:

Partition	File System Format	Contain
0	FAT32	uImage
1	EXT4	Linux rootfs

### **2.2 BUILD ENVIRONMENT REQUIREMENT**

In able to build Linux for JF4418, a host PC which is running Linux such as Ubuntu is required, bellow is the sample of PC configuration:

- CPU Intel core i3 64bit or higher.
- RAM 4GB or higher.
- Ubuntu distro 12.04.

Update Ubuntu and install some necessary software packages

*# sudo apt-get update*

*# sudo apt-get install git-core gnupg flex bison gperf build-essential zip curl libc6-dev libncurses5-dev:i386  
x11proto-core-dev libx11-dev:i386 libreadline6-dev:i386 libgl1-mesa-glx:i386 libgl1-mesa-dev g++-multilib  
mingw32 openjdk-6-jdk tofrodos python-markdown libxml2-utils xsltproc zlib1g-dev:i386 minicom tftpd uboot-  
mkimage expect libgl1-mesa-dri*



## **2.3 INSTALL LINUX BY USING PREBUILT IMAGE**

We can install Linux by using prebuilt image, not need to configure and build the source code, simply follow the bellow steps:

```
# git clone https://github.com/pdtechvn/jf4418.git
```

```
# cd prebuilt/buildroot
```

Insert micro SD card into host PC, suppose we have device node /dev/sdc, run the bellow script to copy Linux image into micro SD card.

```
# sudo ./fusing.sh /dev/sdc
```

When done, insert micro SD card into JF4418 micro SD card socket, power on the board and follow section 2.5 bellow to configure Linux.

## **2.4 INSTALL LINUX BY USING SOURCE CODE**

We can install Linux by following bellow steps:

First, create a working directory for example jf4418\_buildroot

```
# mkdir jf4418_buildroot
```

```
# cd jf4418_buildroot
```

```
# git clone https://github.com/pdtechvn/jf4418\_buildroot\_ext.git
```

```
# git clone git://git.buildroot.net/buildroot
```

```
# cd buildroot
```

```
# git checkout 2015.11.x
```

There are two buildroot default configurations:

- jf4418\_defconfig : for minimum file system
- jf4418\_gui\_defconfig : for large file system

Let's build minimum Linux image:

```
# make BR2_EXTERNAL=./jf4418_buildroot_ext jf4418_defconfig
```

We can include more software package to build, in this case we run menuconfig command:

```
# make menuconfig
```

Then select more software packages if we need include them into Linux root file system (rootfs)

Finally, run make command to build the Linux:

```
# make
```

After building successfully, follow below steps to install Linux image into micro SD card:

*# cd output/deploy*

When first build, we need to build u-boot source code by using external toolchain (one time only):

*# sudo ./build\_uboot.sh*

Insert uSD card into PC, we'll have device name for example /dev/sdx (x should be b,c, or d...)

*# sudo ./fusing.sh /dev/sdx*

Then wait for install process complete.

## **2.5 BOOTING THE LINUX**

### **2.5.1 FIRST BOOT SETTINGS**

To boot the Linux, we need to configure u-boot parameters such as bootcmd, bootargs...

Insert micro SD into micro SD card socket on JF4418, after power on, the board runs u-boot with console prompt s5p4418#, run the bellow commands to set up u-boot environment variables:

*s5p4418# setenv bootcmd 'fatload mmc 0:1 0x48000000 uImage; bootm 0x48000000'*

*s5p4418# setenv bootargs 'console=ttyAMA0,115200n8 root=/dev/mmcblk0p2 rootfstype=ext4 rootwait init=/sbin/init systemd.show\_status=false g\_ether.host\_addr=82:cf:ce:fa:44:18 lcd=HDMI720P60'*

*s5p4418# save*

Then reset the target board:

*s5p4418# reset*

Then JF4418 boots Linux and requests user login on UART console as bellow:

*Welcome to Buildroot*

*buildroot login:*

User name is root with no password.

Note : When use SSH console, we must create password for user account for example :

*# passwd*

*Changing password for root*

*New password:*

### 2.5.1 LINUX SETTINGS

First, to configure WIFI connection, we follow below steps:

```
# wpa_passphrase ssid
```

For example:

```
# wpa_passphrase myssid
```

```
reading passphrase from stdin
```

```
# mypassword
```

Then we have the following result:

```
network={  
    ssid="myssid"  
    #psk="mypassword"  
    psk=2f0568b3492812bd56b946dbaf3fd7dd669b9a4602a09aa6462ff057949b025c  
}
```

Edit file wpa\_supplicant.conf as bellow command:

```
# vi /etc/wpa_supplicant.conf
```

Add above network setting into wpa\_supplicant.conf, the file contain should be

```
ctrl_interface=/var/run/wpa_supplicant  
ap_scan=1  
network={  
    ssid="myssid"  
    #psk="mypassword"  
    psk=2f0568b3492812bd56b946dbaf3fd7dd669b9a4602a09aa6462ff057949b025c  
}
```

Restart Linux in order to restart the WIFI network.

```
# reboot
```

Test WIFI connection by using ping command:

```
# ping www.google.com
```

```
PING www.google.com (216.58.221.228): 56 data bytes
```

```
64 bytes from 216.58.221.228: seq=0 ttl=50 time=40.261 ms
```

```
64 bytes from 216.58.221.228: seq=1 ttl=50 time=46.323 ms
```