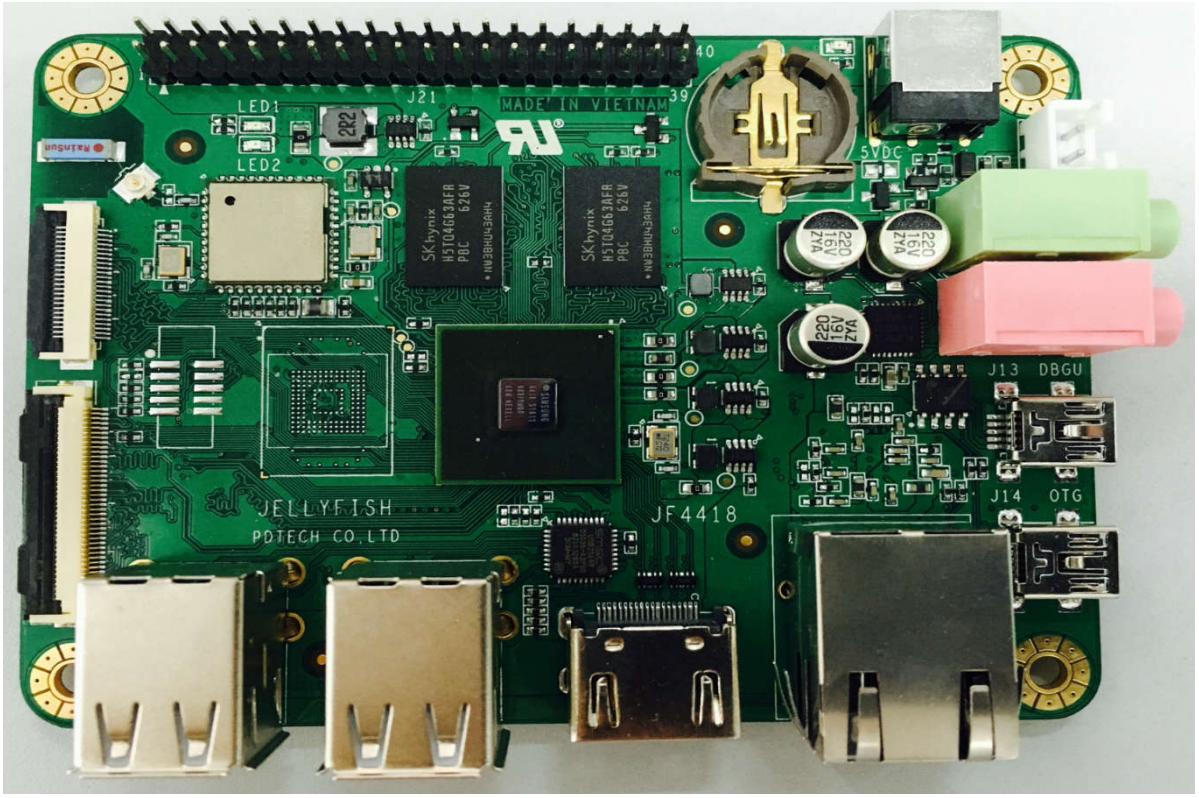

JF4418 USER GUIDE

Revision 1.0
October 2016

Date	Changes	A/M/D	Contents	Revision
24 Oct 2016	All	A	Phuong Dang added new	1.0

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1. INTRODUCTION

1.1 WHAT IS JF4418?

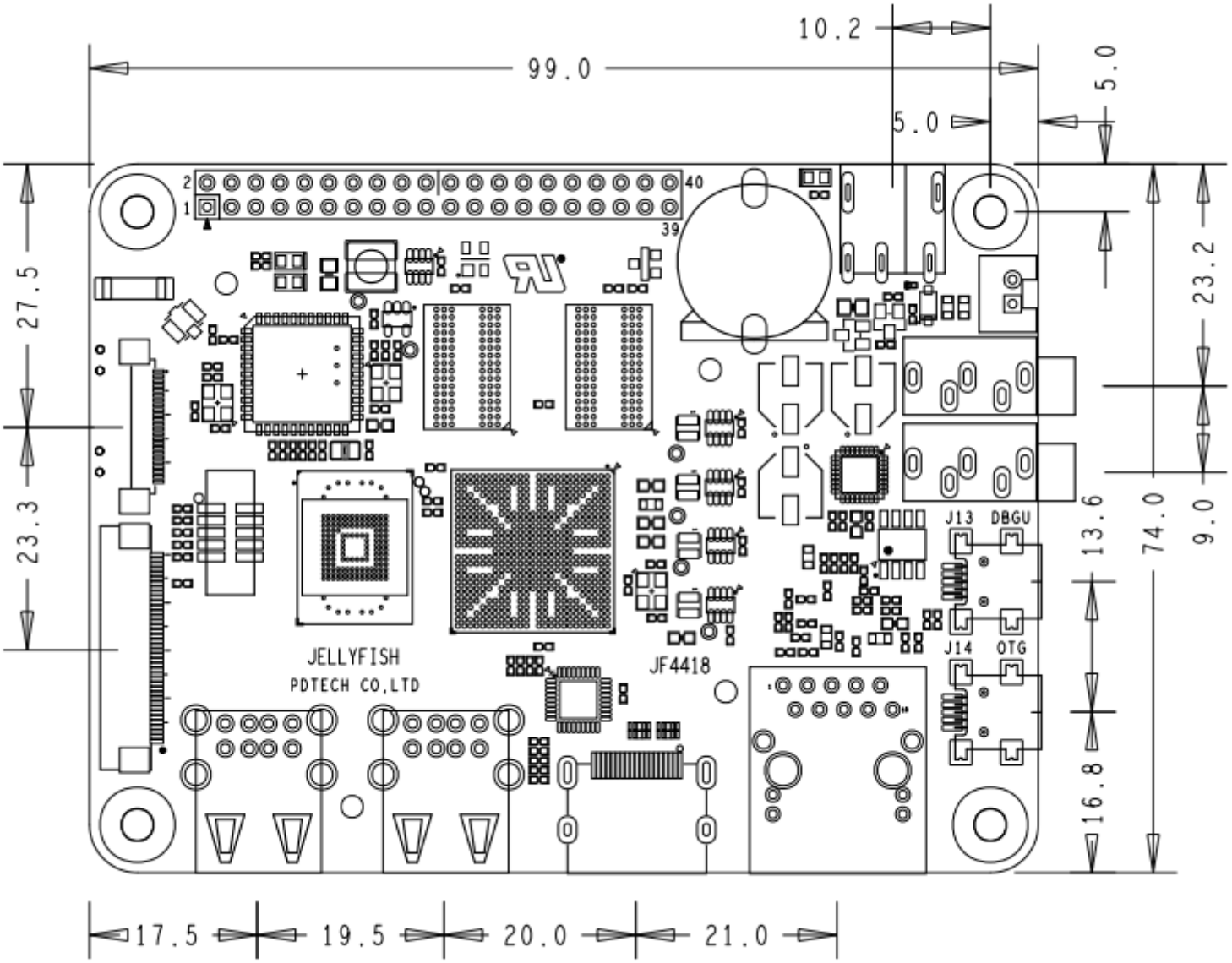
JF4418 is a high performance single board computer (SBC) which is able to run many open source OS such as Debian, Ubuntu, Android 5.0 Lollipop... Based on ARM cortex-A9 processor, JF4418 is powerful development board for software development and easy to use. This uses guide describes information about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

1.2 FEATURES

- CPU S5P4418 ARM Cortext-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.

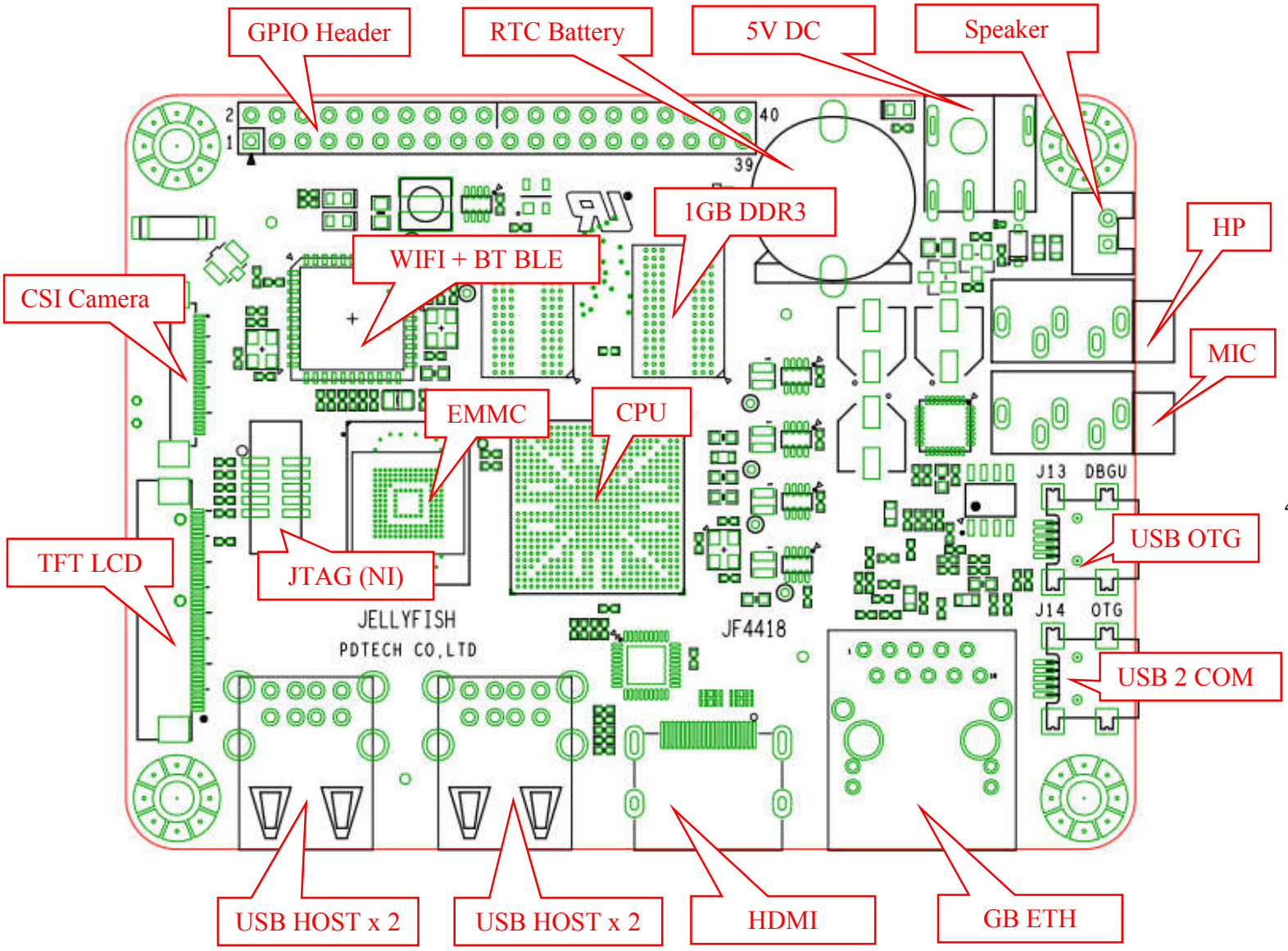
1.3 BOARD PHYSICAL DIMENSION

JF4418 board dimension (mm) as the following image:

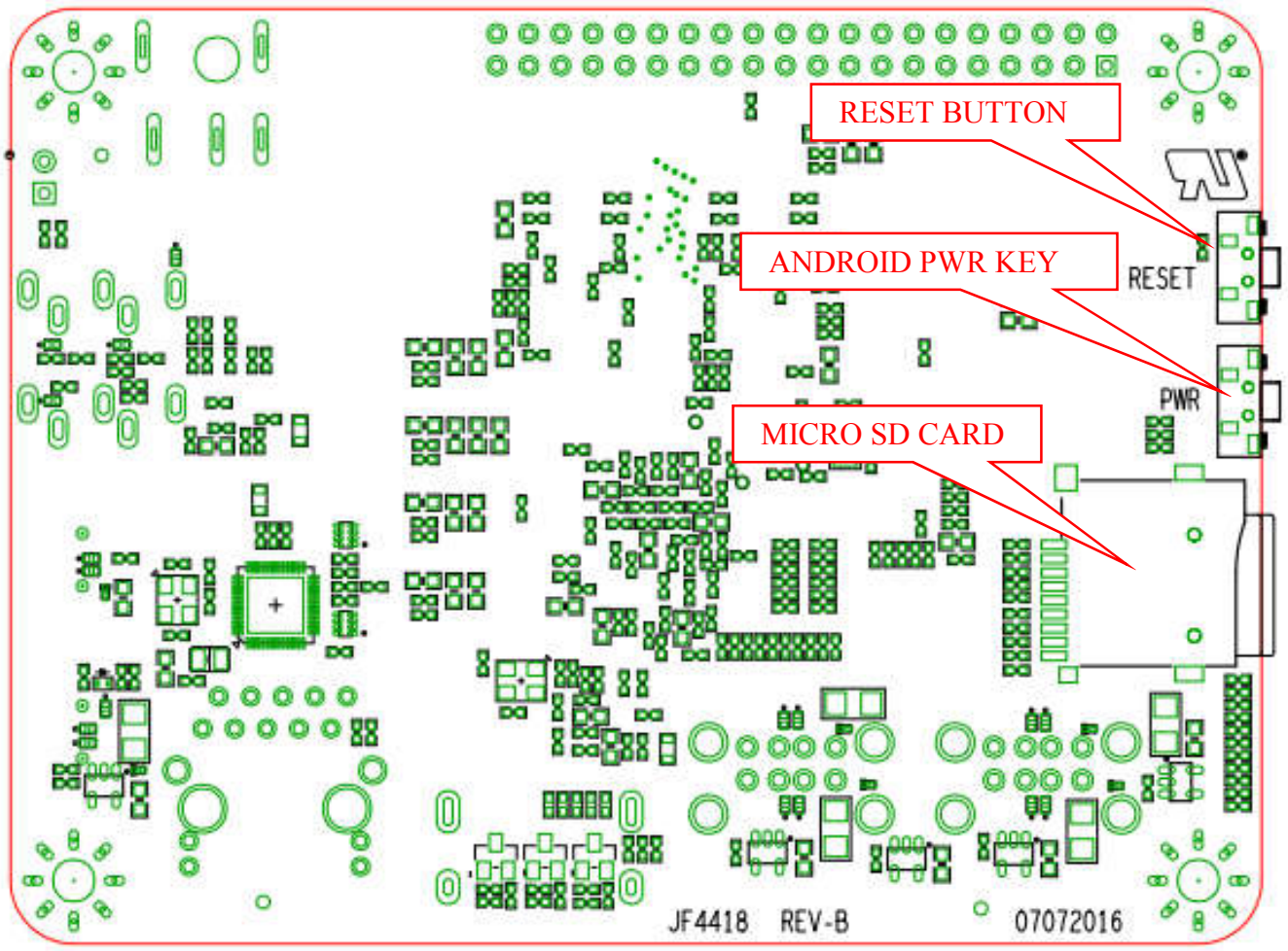


1.4 BOARD COMPONENT DESCRIPTION

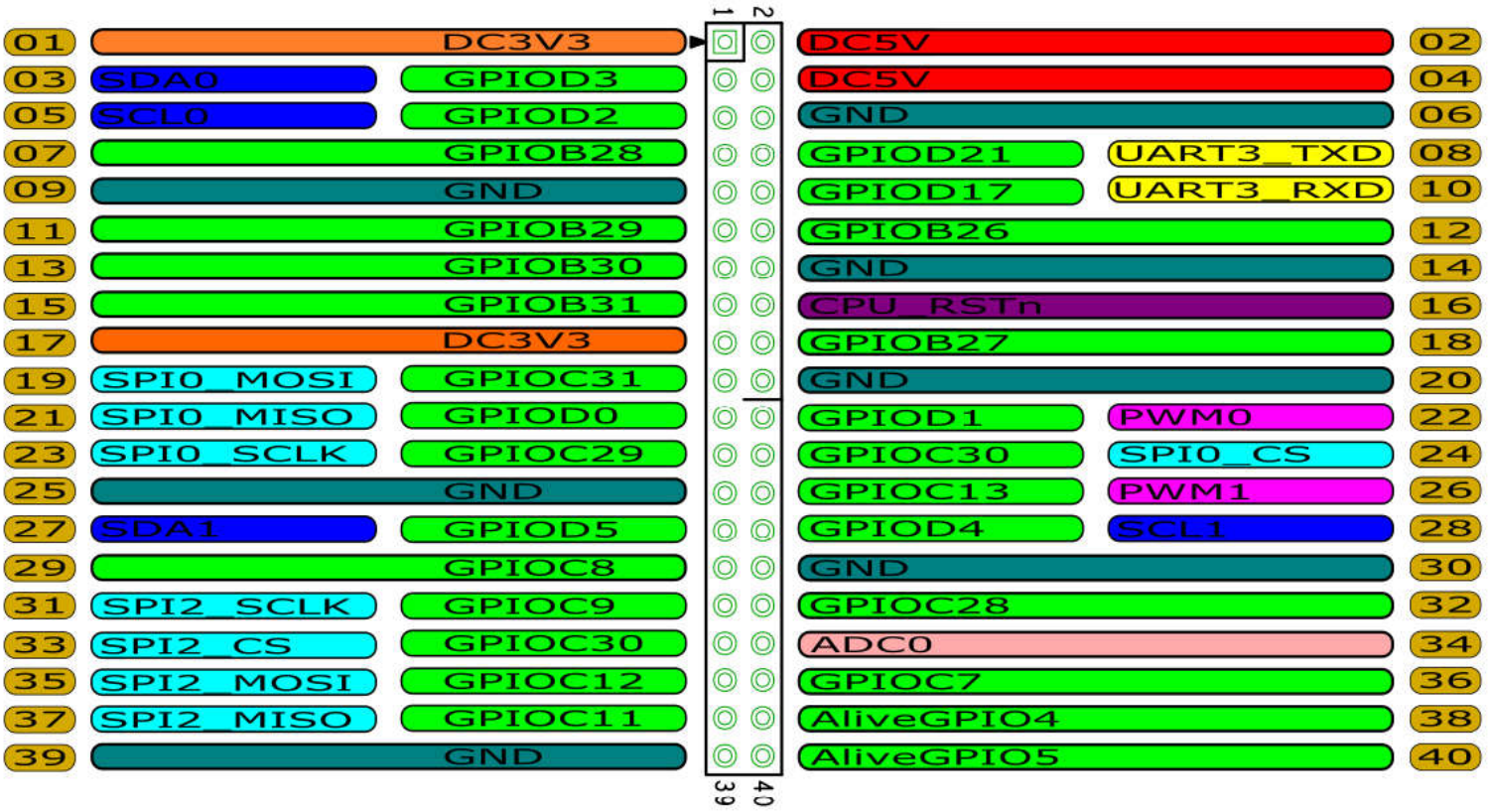
1.4.1 TOP VIEW



1.4.2 BOTTOM VIEW



1.5 BOARD IO HEADER DESCRIPTION



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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 ENVIRONTMENT 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.

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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 toolschain (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