Design Document

UMC-ZBCARD User Manual

Revision History

Issue Date	Version	Description
2018/11/14	1.0	Initial Issued
2018/11/29	2.0	Initial Issued
2018/11/29	3.0	Add Warring message
2018/12/17	4.0	Add part 15 FCC rule
2018/12/19	5.0	Modify part 15C information

Contents

1. Introduction

This User Manual of UMC-ZBCARD is to describe how to use the following sections for lab test by specific qualified engineers or technicians. Furthermore, this SMCC (Smart Metering Communication Card) is NOT intended for commercial use but designed as part of Smart Meter product which mainly provides 4G LTE WAN access. The UMC-ZBCARD is optional for SMCC. For the procedure of SMCC installation and set-up for testing and operating, the information is described as well in the following description.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For Class B digital device or peripheral or cordless phone (15.105) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

◆ Reorient or relocate the receiving antenna.

◆ Increase the separation between the equipment and receiver.

◆ Connect the equipment into an outlet on a circuit different from that to which the receiver is needed.

◆ Consult the dealer or an experienced radio/TV technician for help.

-This is module approval and thus OEM integrator statement and contained ID must be provided.

This device is intended only for OEM integrators under the following conditions:

1) For Meter installations (the end device install with ZB card), the antenna must be installed such that 20 cm is maintained between the antenna and users.

2) The transmitter module may not be co-located with any other transmitter or antenna. As long as the 2 conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, add more device interface etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain meter configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product labeling this transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (For meter device.. The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: {NKR-LMZBCARD}".

The ZigBee antenna type is PIFA. ZigBee Antenna Peak Gain is 0.64 ~ 1.02 dBi

Warning:

Radiation Exposure Statement

This module complies with FCC radiation exposure limits set forth for an uncontrolled environment. This module should be installed and operated with minimum distance of 20cm between radiator and human body.
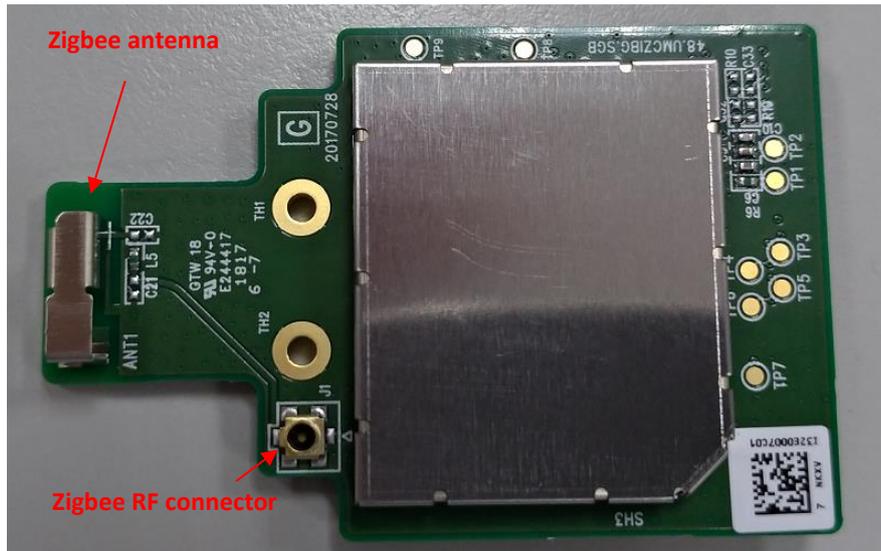
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device.
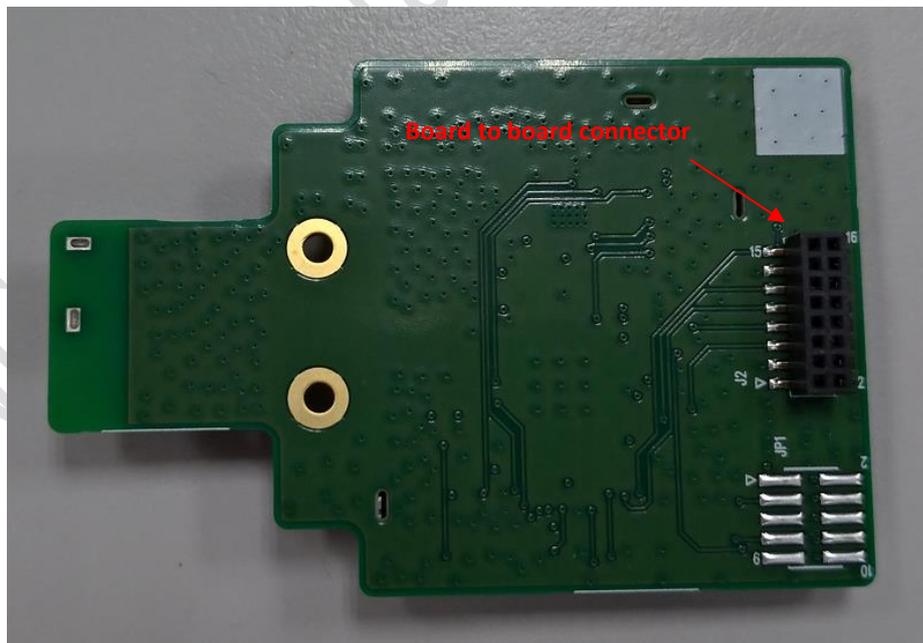
2. Test Setup Configuration

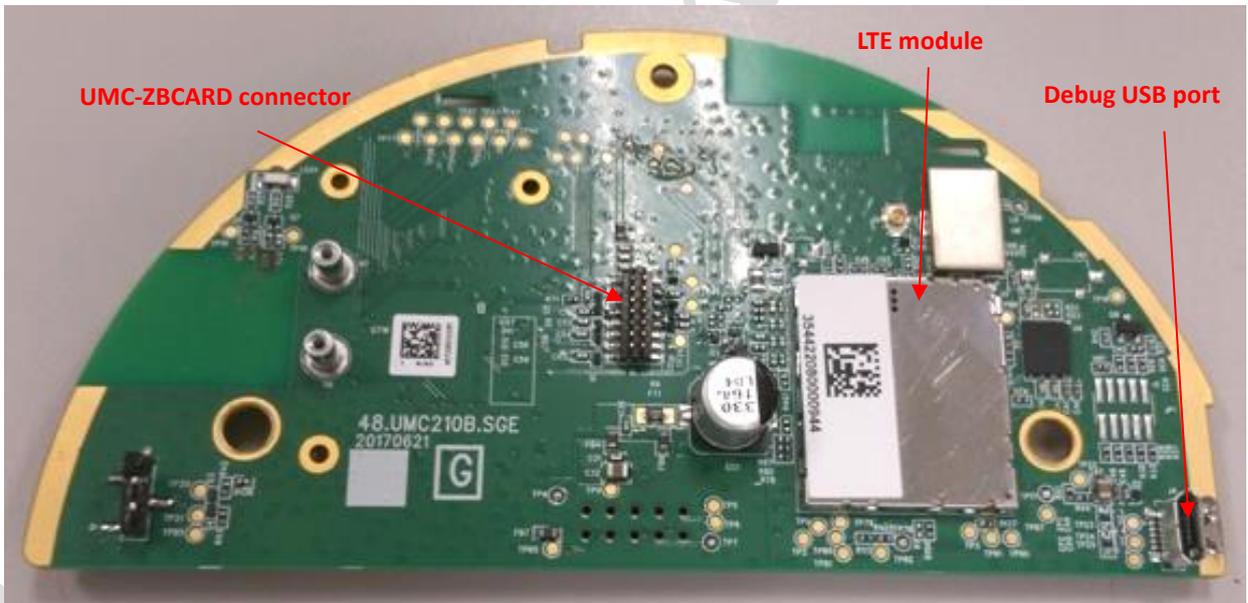## 2.1 Power Supply and Debug Console Connection

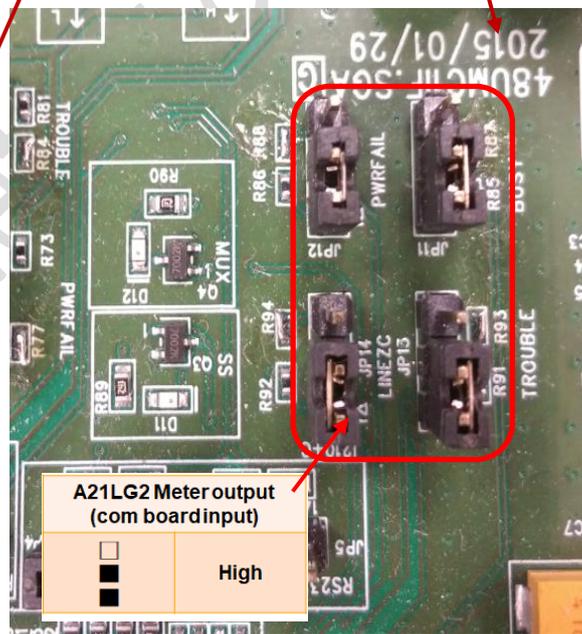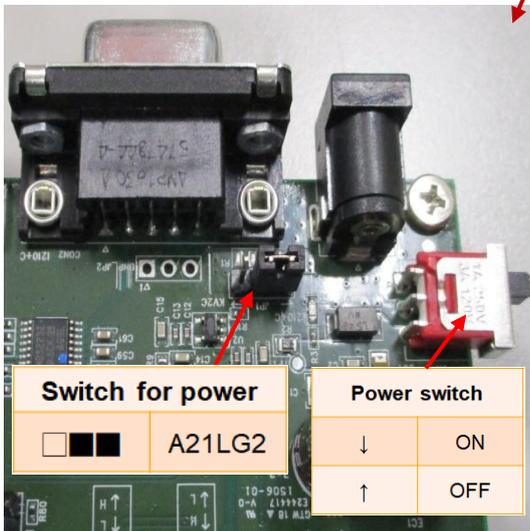### i. UMC-ZBCARD

Top view
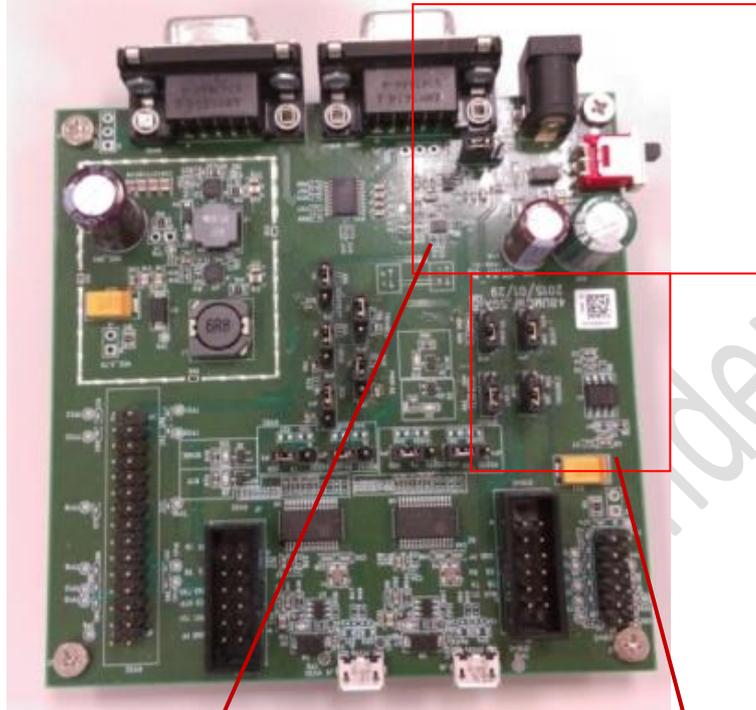

Bottom view

ii.   UMC-A21LG2-R

Top view

Bottom view

Make sure to connect the Zigbee card

iii.   Interface board

Switch for power	
☐■■	A21LG2

Power switch	
↓	ON
↑	OFF

A21LG2 Meter output (com board input)	
☐	
■ ■	High

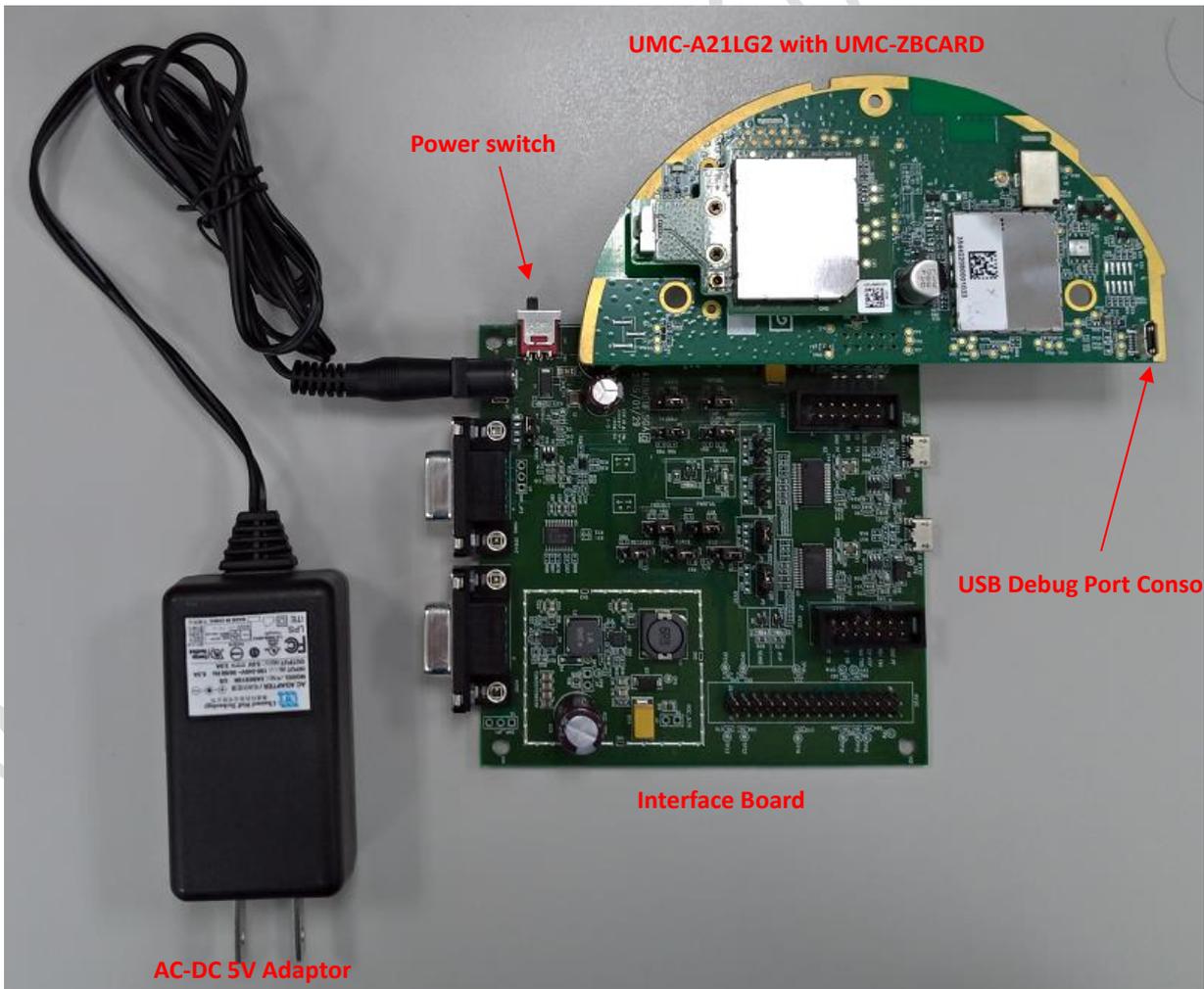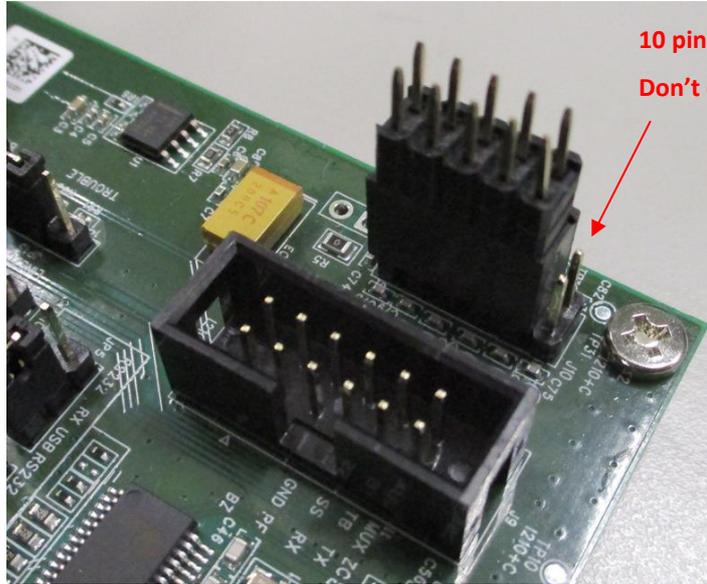*Make sure the jumpers are in right position.*

iv.   Connection between UMC-ZBCARD, UMC-A21LG2-R and interface board

10 pin Connect to interface board

Don't care last 2 pin

UMC-A21LG2 with UMC-ZBCARD

Power switch

USB Debug Port Console

Interface Board

AC-DC 5V Adaptor

Wistron Neweb Corporation Proprietary & Confidential
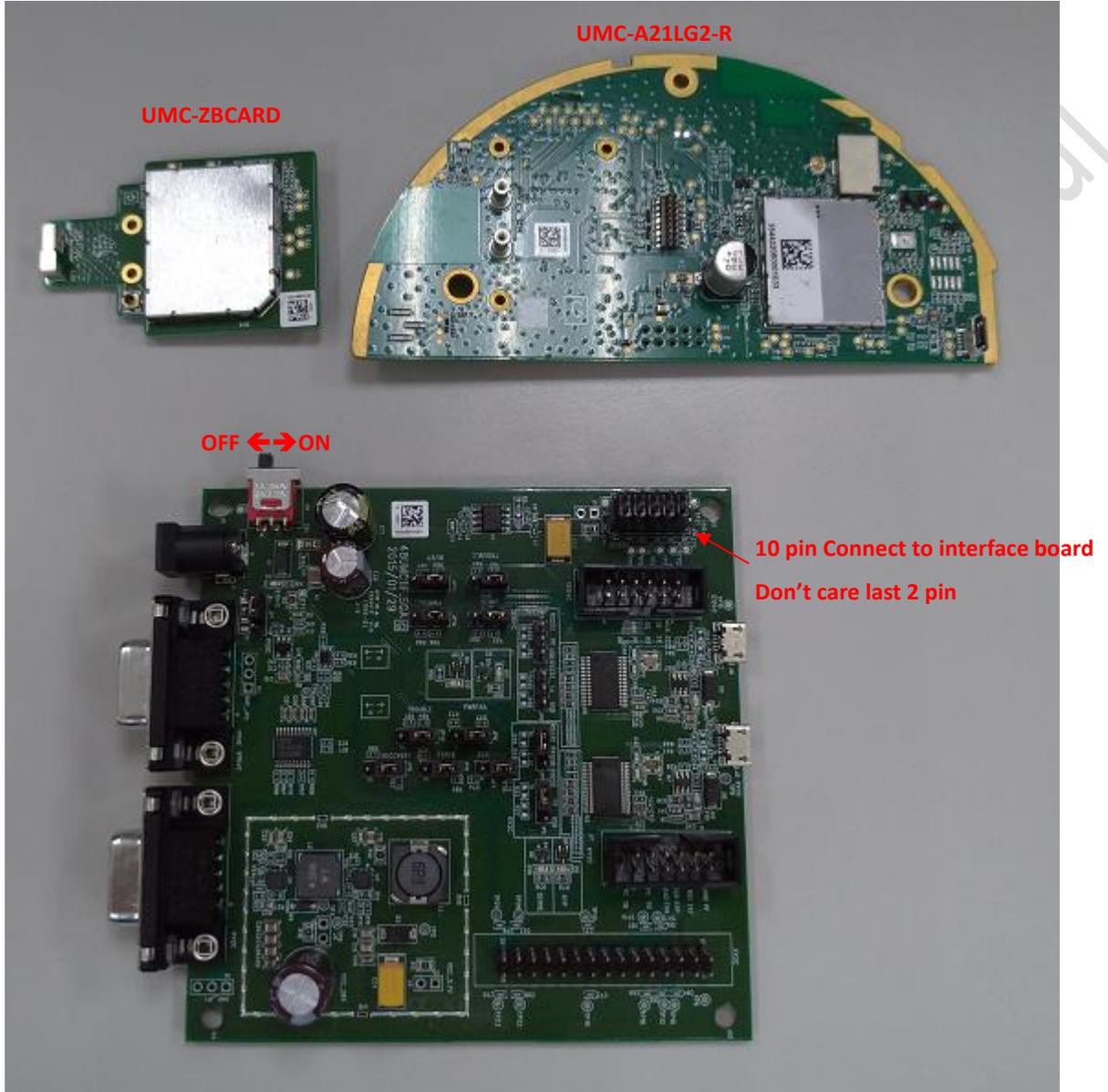
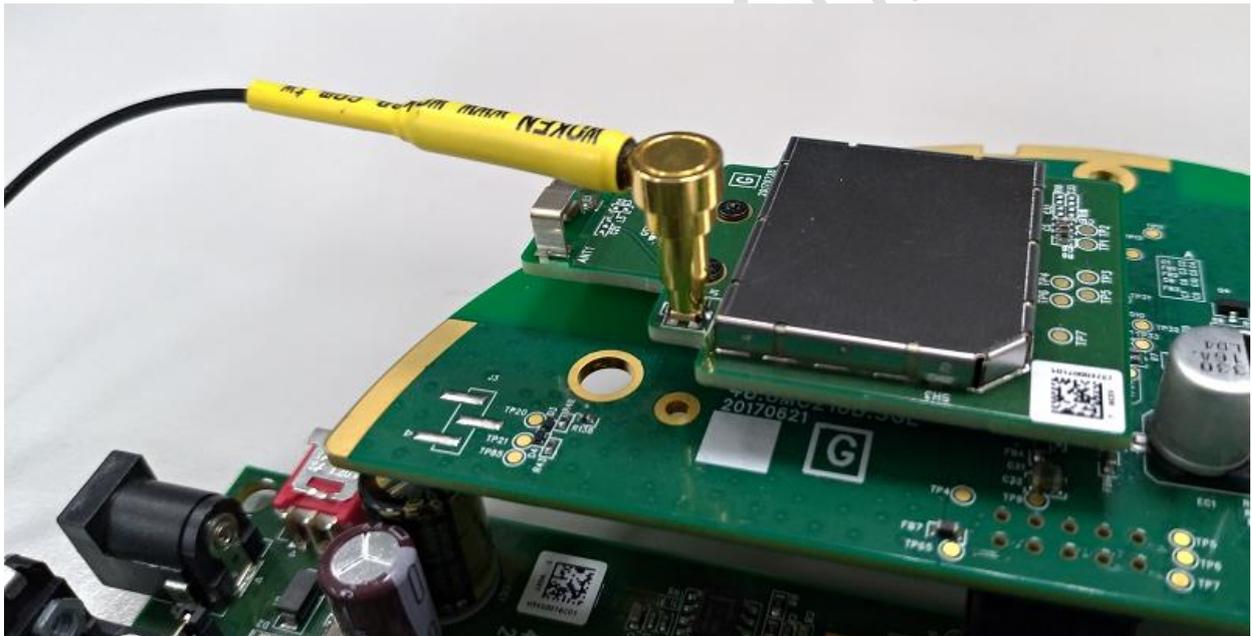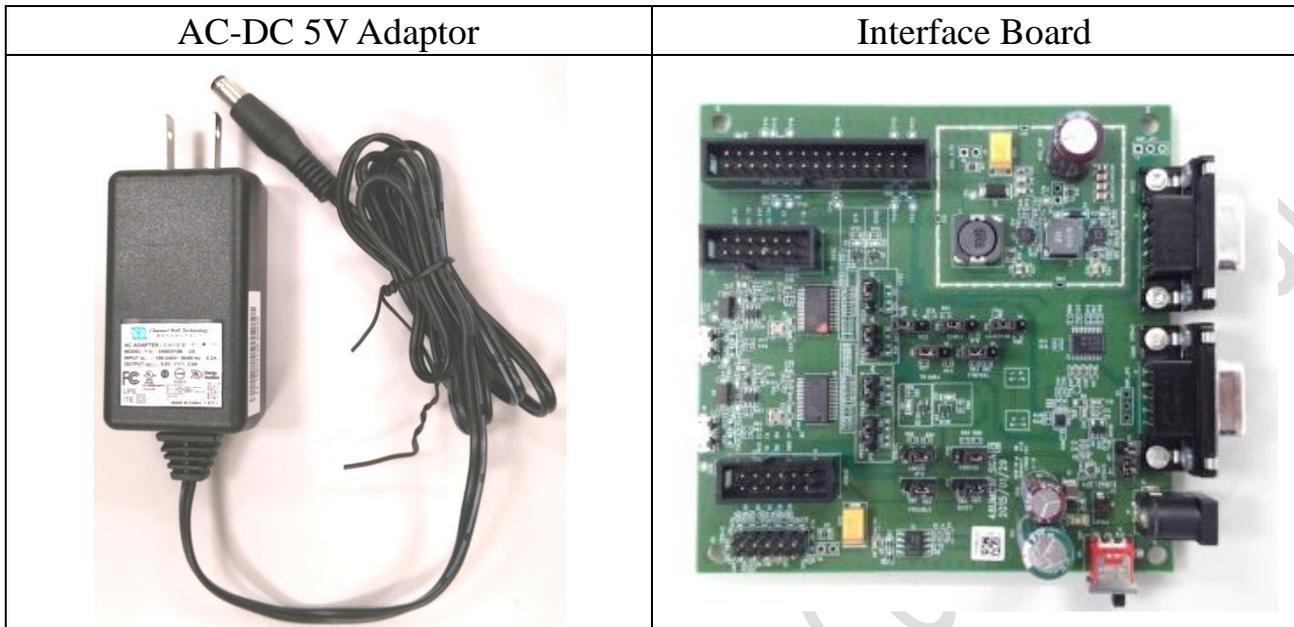## Power on Sequence:

I. Connect UMC-A21LG2-R with UMC-ZBCARD to interface board

II. Attach AC-DC Adaptor & USB Debug Port Cable

III. Turn on by the power switch

IV. Wait for 20 seconds when system ready

2.2 Zigbee Connection

Connect to Zigbee RF connector for conducted test

2.3 Hardware Component Introduction

UMC-ZBCARD
UMC-A21LG2-R

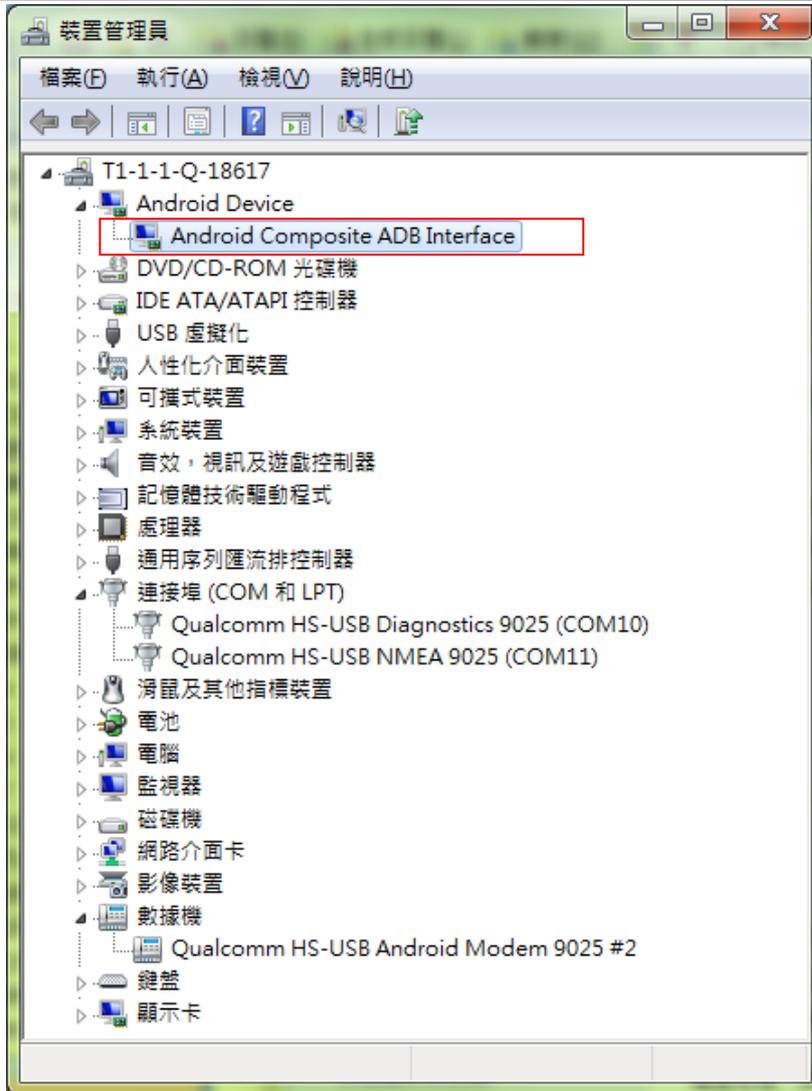| AC-DC 5V Adaptor	Interface Board

2.4 Install Qualcomm USB driver

Install the Qualcomm USB driver & ADB driver

2.5 Confirm the Qualcomm device

Confirm the Android Device "Android Comosite ADB interface"
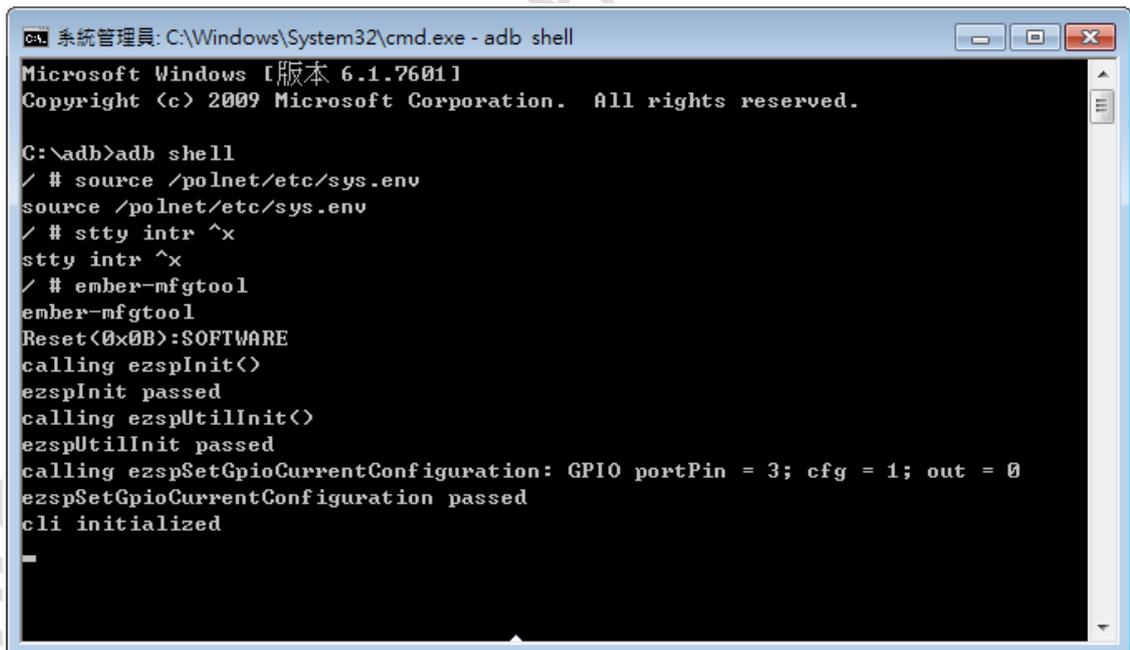
3. Zigbee test

3.1 Firmware version of Application

Command in Command Prompt:

adb shell

Command in adb shell:

source /polnet/etc/sys.env

stty intr ^x

```
系統管理員: C:\Windows\System32\cmd.exe - adb shell

Microsoft Windows [版本 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\adb>adb shell
/ # source /polnet/etc/sys.env
source /polnet/etc/sys.env
/ # stty intr ^x
stty intr ^x
/ # ember-mfgtool
ember-mfgtool
Reset(0x0B):SOFTWARE
calling ezspInit()
ezspInit passed
calling ezspUtilInit()
ezspUtilInit passed
calling ezspSetGpioCurrentConfiguration: GPIO portPin = 3; cfg = 1; out = 0
ezspSetGpioCurrentConfiguration passed
cli initialized
_
```

3.2 ZigBee Test Command


```
# 
# ember-mfgtool
Reset(0x0B):SOFTWARE
ezspInit passed
ezspUtilInit passed
setting GPIO portPin = 3; cfg = 1; out = 0
mfg start 1
  mfglib start (01), status 0x00


MFG RX 0001 pkts
first packet: lqi FD, rssi B2, len 32
        : 41 88 64 36 12 FF FF BA DC 09 12 FC FF BA DC 01
        : D3 5B A4 09 00 00 A3 22 00 28 71 01 00 00 5B A4
        : 09 00 00 A3 22 00 00 89 F1 97 25 F5 FE 2B CE 62
        : CE 36

MFG RX 0001 pkts
first packet: lqi FF, rssi C2, len 2F
        : 41 88 EF CD CA FF FF 00 00 09 12 FC FF 00 00 01
        : F7 01 90 78 56 34 12 DB 00 28 05 14 00 00 01 90
        : 78 56 34 12 DB 00 00 CC C3 E4 D1 D3 C6 7D DA
mfg channel set 11
    mfg set channel to 0x0B, status 0x00


MFG RX 0007 pkts
first packet: lqi FC, rssi B1, len 33
        : 41 88 65 36 12 FF FF BA DC 09 12 FC FF BA DC 1E
        : D4 5B A4 09 00 00 A3 22 00 28 72 01 00 00 5B A4
        : 09 00 00 A3 22 00 00 16 BA 15 A9 A6 65 DB E2 03
        : AF 3E C4
mfg power set -3 mode 2
      mfg set power to 0xFD, mode 0x02, status 0x00

mfg stream start
  start stream 0x00

mfg stream stop
  stop stream 0x00


MFG RX 0003 pkts
first packet: lqi FF, rssi C2, len 33
        : 41 88 F3 CD CA FF FF 00 00 09 12 FC FF 00 00 1E
        : F9 01 90 78 56 34 12 DB 00 28 09 14 00 00 01 90
        : 78 56 34 12 DB 00 00 A4 7D 57 D2 61 AE A5 BD E9
        : 2C FE 66
^C# 
```

Enter Zigbee control mode:
ember-mfgtool

Set mfg start:
mfg start 1

Freq. channel setting:
mfg channel set 11
Channel Low : 11 -> CH11
Channel Mid : 18 -> CH18
Channel High : 25 -> CH25

Power level/mode setting:
mfg power set -3 mode 2

Single tone output:
mfg tone start

Single tone output stop:
mfg tone stop

Modulation signal output:
mfg stream start

Modulation signal output stop :
mfg stream stop

Exit:
<Ctrl>+<X>
<Enter>

4. Interfaces

This SMCC offers following interfaces to communicate with module. Before using USB emulated ports, it requires to install the Qualcomm's USB driver on your windows PC in advance. After driver installation is finished, device manager will show below USB emulated COM ports.

4.1 Qualcomm HS-USB MDM Diagnostics 90B2 (COM port)

This port is created for modem debugging purpose and used by Qualcomm PC tools to communicate with the module. Qualcomm's tool is protected by Qualcomm License.
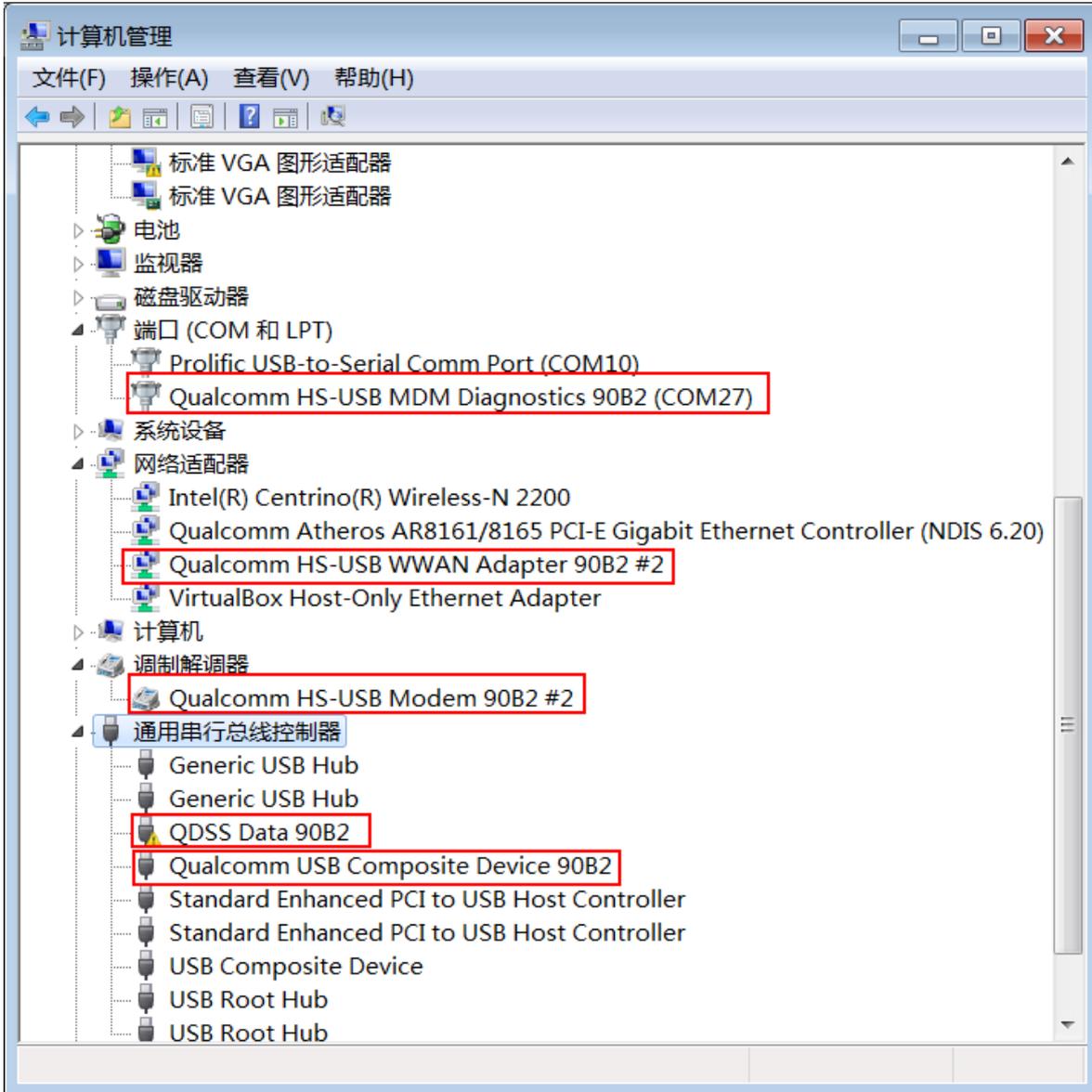
4.2 Qualcomm HS-USB WWAN Adapter 90B2

This port is created as a virtual network interface which could be used by PC to connect with Internet.

4.3 Qualcomm HS-USB Modem 90B2

This port is also called as modem port. Testers could use PC terminal tool to connect with the port and send AT commands to control modem directly.

5. Appendix I

Environmental Setup

1. Windows 7 x64

The environment setup was tested on Windows 7 x64 successfully.

2. USB driver

QUD.WIN.1.1 Installer will be needed to be installed for the following ports:

➢ Qualcomm HS-USB MDM Diagnostics 90B2
➢ Qualcomm HS-USB MDM WWAN Adapter 90B2
➢ Qualcomm USB Composite Device 90B2
➢ QDSS Data 90B2
➢ Qualcomm HS-USB Modem 90B2

3. ADB driver

http://adbdriver.com/