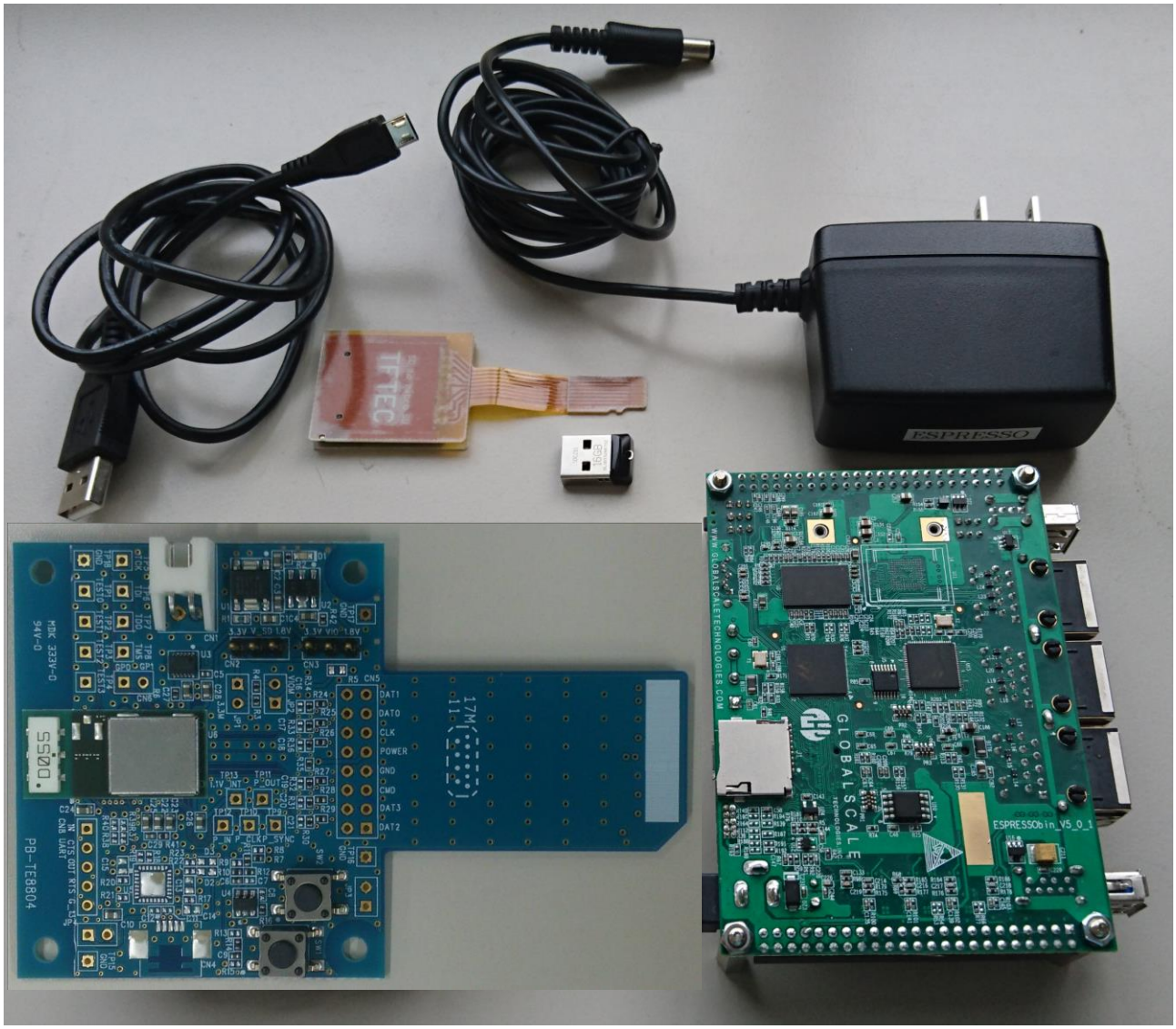
Wireless LAN and *Bluetooth*® Module Evaluation Kit

(For WYSAGVDXG)

WKSAGVDXG



This evaluation kit is an object for experiment of operation, and does not guarantee quality. Moreover, the conditions of a module of operation are not recommended in the schematic, the parts, the software, etc. currently used for evaluation kit.

ATTENTION: This module requires device drivers that are under Japan export control. Depending on the customer's country and application (e.g. weapons), Taiyo Yuden may not be able to provide these drivers to all customers. Please contact your local Taiyo Yuden sales office for additional information.

To contact your local sales office and for additional product information, please visit www.ty-top.com.

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Rev. Records

My.19.2019> Ver.1.0 Release

Introduction

This evaluation kit is developed for communication test of ***Wireless LAN*** and ***Bluetooth***® module which TAIYO YUDEN develops and sells.
This evaluation kit makes it possible to perform easily the communication test of ***Wireless LAN*** and ***Bluetooth***® module of TAIYO YUDEN CO., LTD.

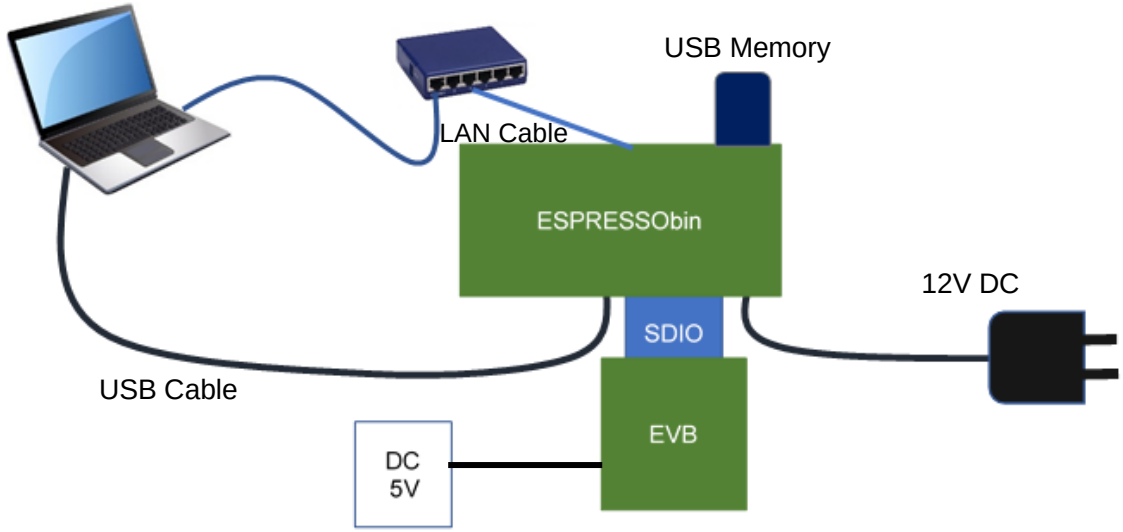
Conformity module

WYSAGVDXG

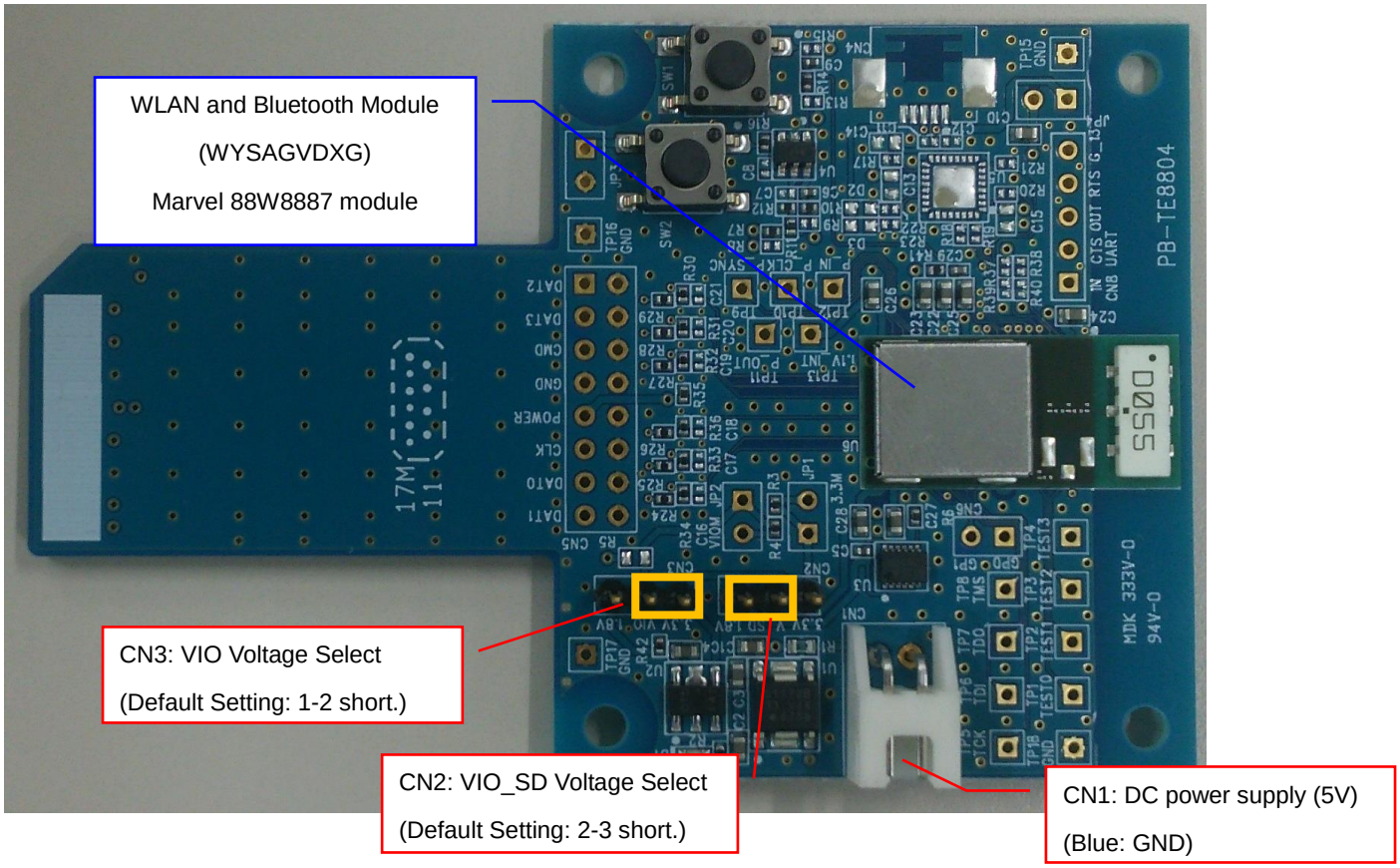
Accessories

1	Evaluation Board (WBSAGVDXG)	1 piece
2	DC Power Cable	1 piece
3	ESPRESSObin	1 piece
4	AC Adapter	1 piece
5	USB Memory	1 piece
6	USB Cable	1 piece
7	SD – Micro SD Conversion Cable	1 piece

The example of connection



Evaluation board layout



Pin description of evaluation board

WBSAGVDXG (TE8804)

CN1: DC Power Supply

No.	Pin name	Direction	Description
1	5V	Input	5.0V input.
2	GND	GND	Ground

CN2: VIO_SD Voltage Select (Default Setting: 2-3 short.)

No.	Pin name	Direction	Description
1	3.3V	Output	3.3V output.
2	VIO_SD	Input	Input for VIO_SD.
3	1.8V	Output	1.8V output.

CN3: VIO Voltage Select (Default Setting: 1-2 short.)

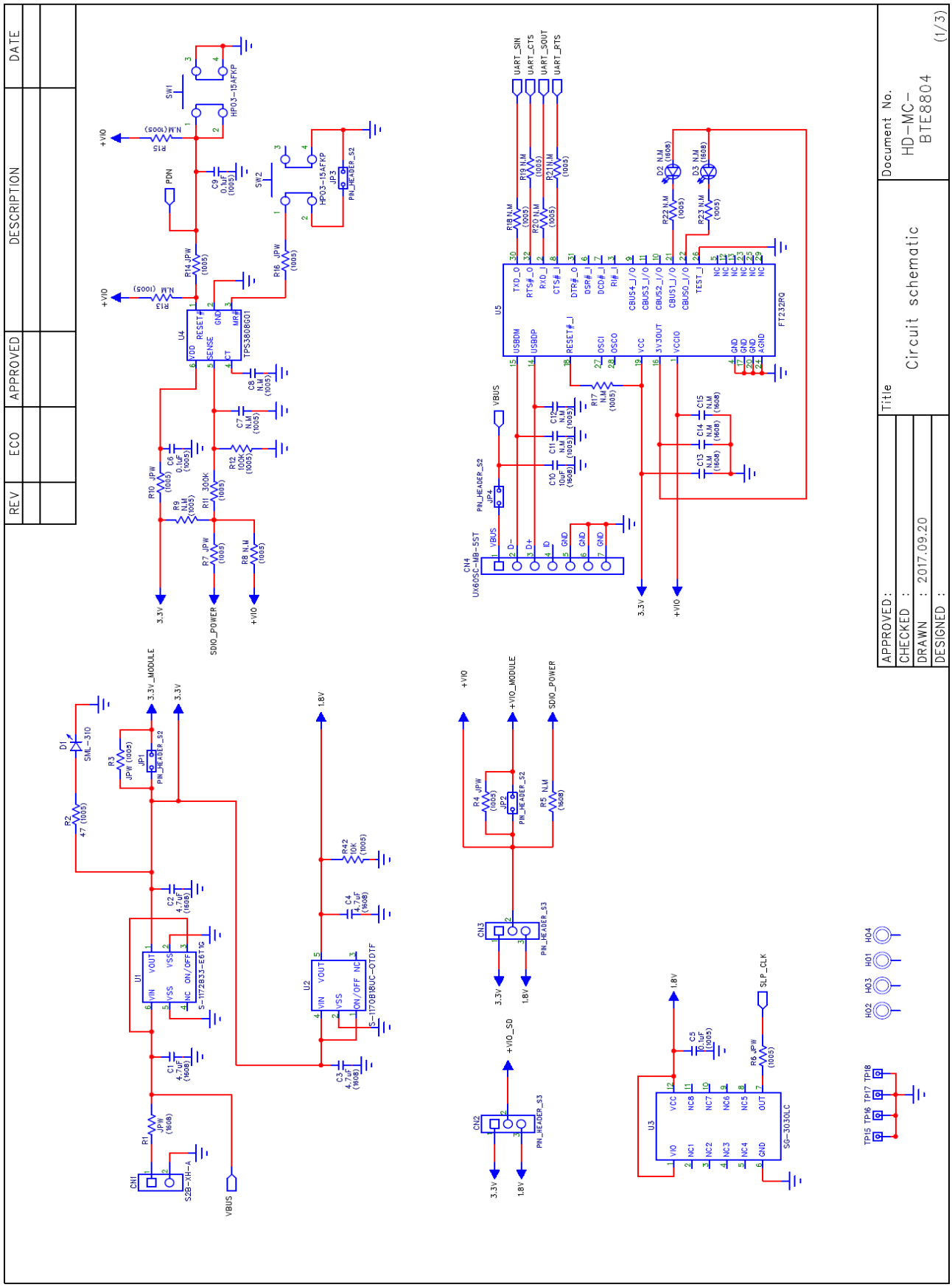
No.	Pin name	Direction	Description
1	3.3V	Output	3.3V output.
2	VIO	Input	Input for VIO.
3	1.8V	Output	1.8V output.

BOM of evaluation board

WBSAGVDXG (TE8804)

Ref Name	Description	Parts name	Supplier
U1	IC(LDO 3.3V)	S-1172B33-E6T1G	SII or equivalent
U2	IC(LDO1.8V)	S-1170B18UC-OTDTF	SII or equivalent
U3	IC(32.768kHz clock)	SG-3030LC	EPSON or equivalent
U4	IC	TPS3808G01DBVT	TI or equivalent
U5	N.M	N.M.	
U6	Module	WYSAGVDXG	TAIYO YUDEN
SW1	SWITCH	HP03-15AFKP2	NKK SWITCHES or equivalent
SW2	SWITCH	HP03-15AFKP2	NKK SWITCHES or equivalent
CN1	CONNECTOR	S2B-XH-A	JST or equivalent
CN2	CONNECTOR	PIN_HEADER_S3	
CN3	CONNECTOR	PIN_HEADER_S3	
CN4-CN8	N.M.	N.M.	
JP1-JP4	N.M.	N.M.	
C1	CAPACITOR	LMK107 BJ475KA	TAIYO YUDEN
C2	CAPACITOR	LMK107 BJ475KA	TAIYO YUDEN
C3	CAPACITOR	LMK107 BJ475KA	TAIYO YUDEN
C4	CAPACITOR	LMK107 BJ475KA	TAIYO YUDEN
C5	CAPACITOR	EMK105 BJ104KV	TAIYO YUDEN
C6	CAPACITOR	EMK105 BJ104KV	TAIYO YUDEN
C7-C8	N.M.	N.M.	
C9	CAPACITOR	EMK105 BJ104KV	TAIYO YUDEN
C10	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C11-C21	N.M.	N.M.	
C22	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C23	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C24	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C25	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C26	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C27	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C28	CAPACITOR	JMK107 BJ106MA	TAIYO YUDEN
C29	CAPACITOR	UMK105 CH100CV-F	TAIYO YUDEN
R1	RESISTOR	MCR03EZHJ000	ROHM or equivalent
R2	RESISTOR	MCR01 MRT J 470	ROHM or equivalent

Ref Name	Description	Parts name	Supplier
R3	RESISTOR	MCR01 MRT J000	ROHM or equivalent
R4	RESISTOR	MCR01 MRT J000	ROHM or equivalent
R5	N.M.	N.M.	
R6	RESISTOR	MCR01 MRT J000	ROHM or equivalent
R7	RESISTOR	MCR01 MRT J000	ROHM or equivalent
R8-R9	N.M.	N.M.	
R10	RESISTOR	MCR01 MRT J000	ROHM or equivalent
R11	RESISTOR	MCR01 304J	ROHM or equivalent
R12	RESISTOR	MCR01 MRT J104	ROHM or equivalent
R13	N.M.	N.M.	
R14	RESISTOR	MCR01 MRT J000	ROHM or equivalent
R15	N.M.	N.M.	
R16	RESISTOR	MCR01 MRT J000	ROHM or equivalent
R17-R23	N.M.	N.M.	
R24	RESISTOR.	MCR01 MRT J220	ROHM or equivalent
R25	RESISTOR.	MCR01 MRT J220	ROHM or equivalent
R26	RESISTOR.	MCR01 MRT J220	ROHM or equivalent
R27	RESISTOR.	MCR01 MRT J220	ROHM or equivalent
R28	RESISTOR.	MCR01 MRT J220	ROHM or equivalent
R29	RESISTOR.	MCR01 MRT J220	ROHM or equivalent
R30	RESISTOR	MCR01 MRT J473	ROHM or equivalent
R31	RESISTOR	MCR01 MRT J473	ROHM or equivalent
R32	RESISTOR	MCR01 MRT J473	ROHM or equivalent
R33	RESISTOR	MCR01 MRT J473	ROHM or equivalent
R34	RESISTOR	MCR01 MRT J473	ROHM or equivalent
R35	RESISTOR	MCR01 MRT J102	ROHM or equivalent
R36	RESISTOR	MCR01 MRT J473	ROHM or equivalent
R37-R40	N.M.	N.M.	
R41	RESISTOR	MCR01 MRT J104	ROHM or equivalent
R42	RESISTOR	MCR01 103J	ROHM or equivalent
D1	LED	SML-D12M	ROHM or equivalent
D2-D3	N.M.	N.M.	
TP1-13	N.M.	N.M.	
TP15-18	N.M.	N.M.	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Document No.
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(1/3)
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DRAWN : 2017.09.20
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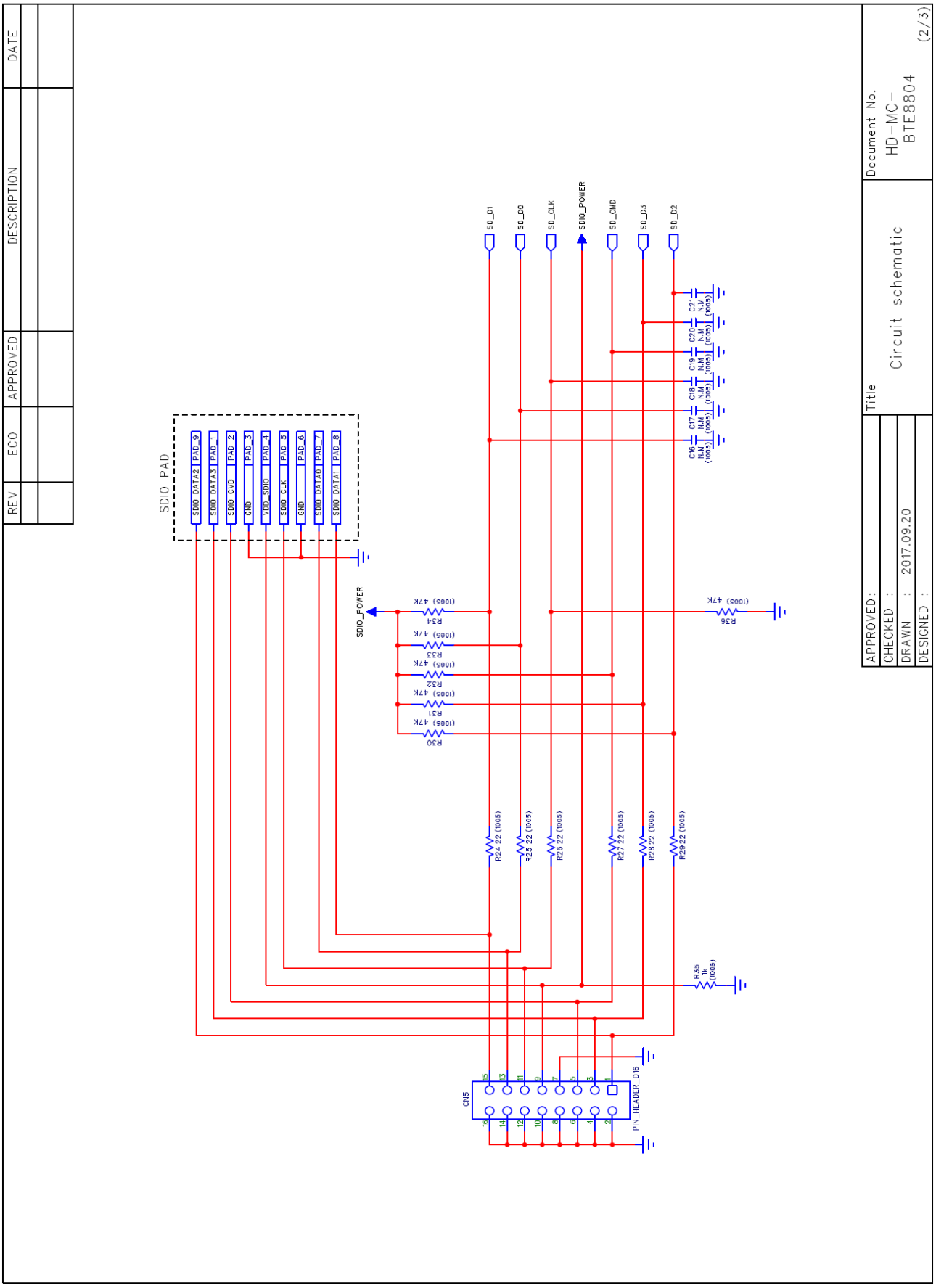
U4
TPS3808G01
U5
FT232RQ
U1
S-1172B33-E6T1G
U2
S-1170B18UC-OTDTF
U3
SG-3030LC
CN1
S2B-XH-A
CN2
PIN_HEADER_S3
CN3
PIN_HEADER_S3
CN4
UX60SC-MB-5ST
JP1
PIN_HEADER_S2
JP2
PIN_HEADER_S2
JP3
PIN_HEADER_S2
JP4
PIN_HEADER_S2
SW1
HP03-15AFKP
SW2
HP03-15AFKP
D1
SML-310
D2 N.M (1608)
D3 N.M (1608)
+VIO
3.3V
1.8V
VBUS
SDIO_POWER
+VIO_MODULE
+VIO_SD
3.3V_MODULE
SLP_CLK
UART_SIN
UART_CTS
UART_SOUT
UART_RTS


REV
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APPROVED
DESCRIPTION
DATE
SDIO PAD
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SD_D1
SD_D0
SD_CLK
SDIO_POWER
SD_CMD
SD_D3
SD_D2
CN5
PIN_HEADER_D16
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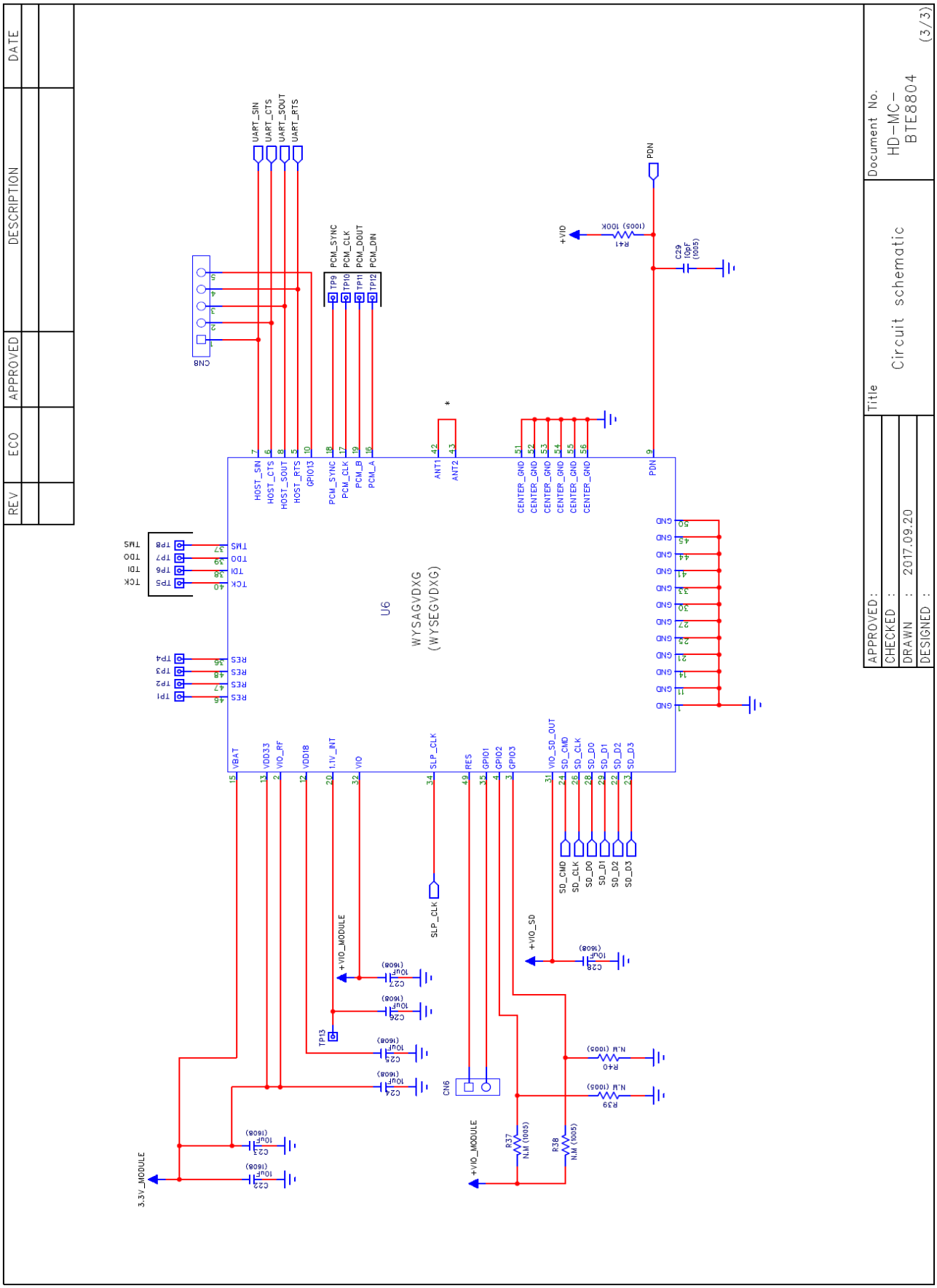
HD-MC-BTE8804
(2/3)
Title
Circuit schematic
APPROVED:
CHECKED :
DRAWN : 2017.09.20
DESIGNED :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ECO
APPROVED
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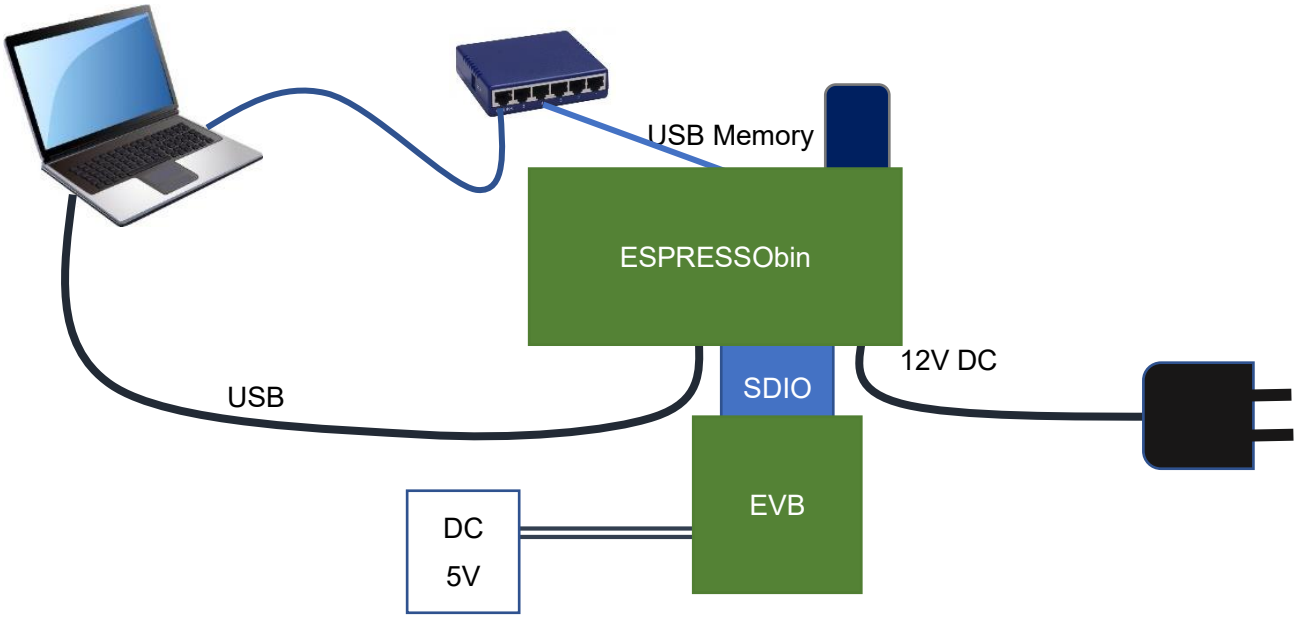
DATE
Document No.
HD-MC-
BTE8804
(3/3)
Title
Circuit schematic
APPROVED:
CHECKED :
DRAWN : 2017.09.20
DESIGNED :
U6
WYSAGVDXG
(WYSEGVDXG)
CN8
CN6
UART_SIN
UART_CTS
UART_SOUT
UART_RTS
PCM_SYNC
PCM_CLK
PCM_DOUT
PCM_DIN
PDN
+VIO
SD_CMD
SD_CLK
SD_D0
SD_D1
SD_D2
SD_D3
SLP_CLK
+VIO_SD
+VIO_MODULE
3.3V_MODULE
TP13
R41 100K (1005)
C29 10pF (1005)
C28 10uF (1608)
C27 10uF (1608)
C26 10uF (1608)
C25 10uF (1608)
C24 10uF (1608)
C23 10uF (1608)
C22 10uF (1608)
R40 N.M (1005)
R39 N.M (1005)
R37 N.M (1005)
R38 N.M (1005)

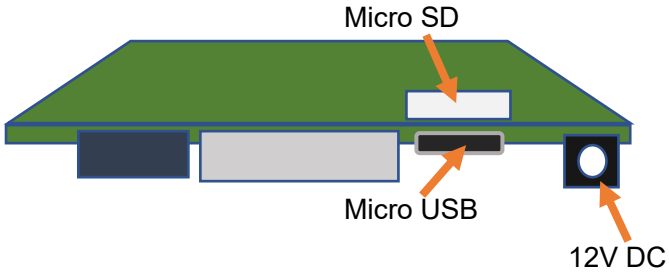
Evaluation guide book of TAIYO YUDEN Wireless Module on the ESPRESSObin (88W8887)

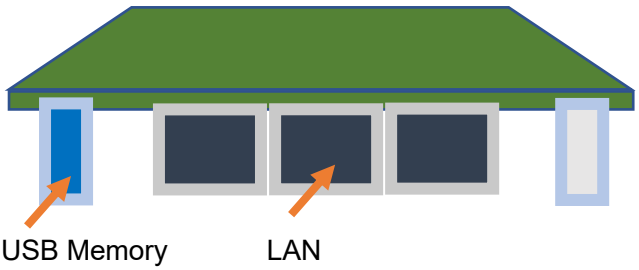
Version 1.1: 24-May-2019

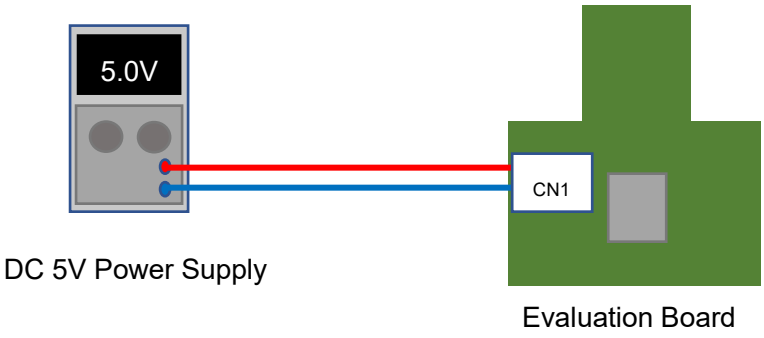
1. Block Diagram for H/W



Detailed Block Diagram







2. Open serial console on the PC

First connect the ESPRESSObin and the PC with the USB cable.

ESPRESSObin power supply remains OFF.

Open the corresponding port with serial communication software. (terminal software)

Follow the tutorial for your OS to make sure you have everything needed.

Windows:

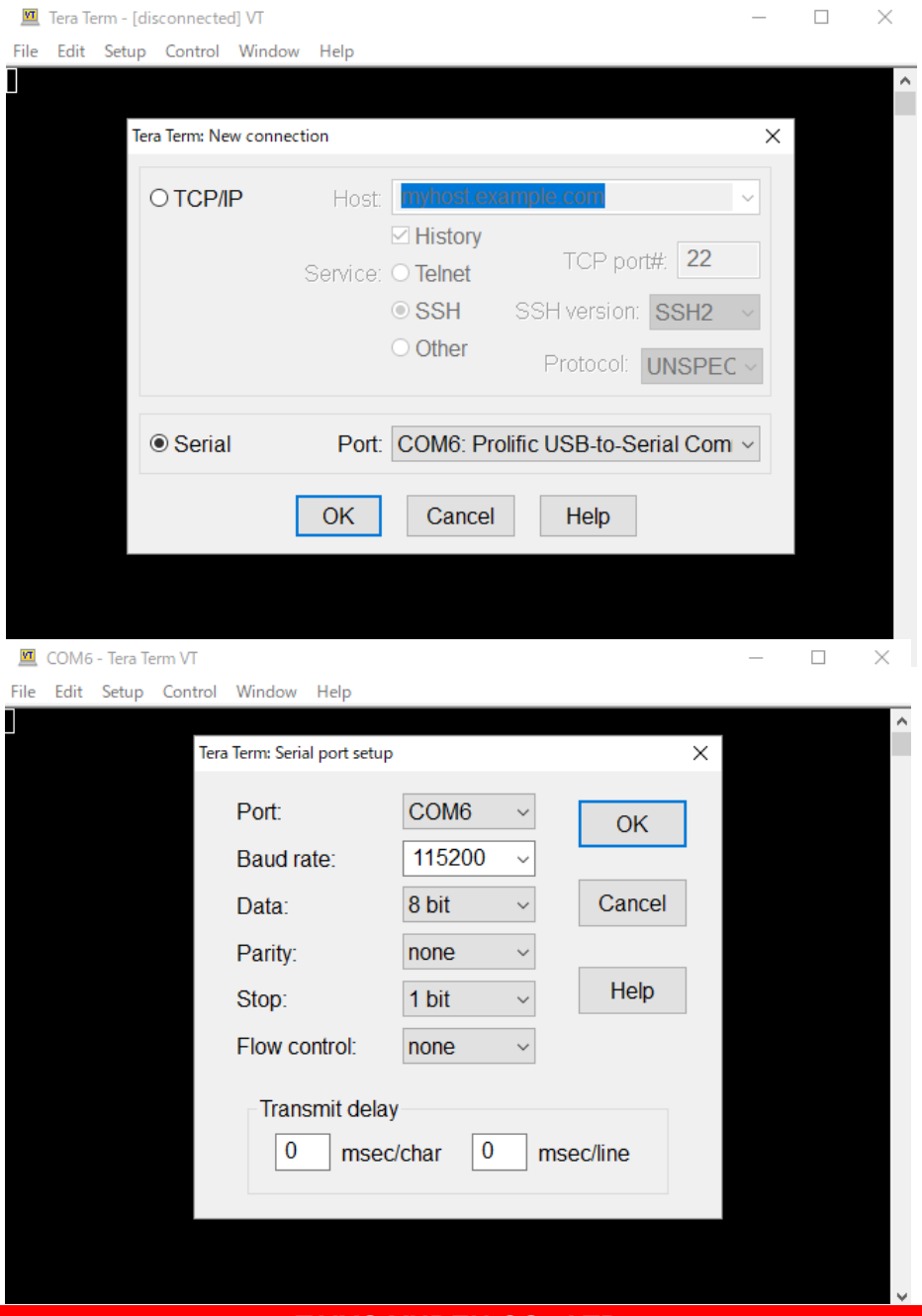
http://wiki.espressobin.net/tiki-index.php?page=Serial+connection+-+Windows

Linux

http://wiki.espressobin.net/tiki-index.php?page=Serial+connection+-+Linux

For example

Tera Term on the Windows PC



3. Power on the ESPRESSObin

Plug your power adapter to the 12V DC Jack.
When the ESPRESSObin starts to boot, you can check following messages.

```
TIM-1.0
WTMI-armada-17.10.1-b90dbf0
ENTER init_ddrgen
DDR_TOPOLOGY is 4 :        DDR3, 1CS 1G
WTMI_CLOCK=2
    《 (skip)
MMC:     sdhci@d0000: 0, sdhci@d8000: 1
SF: Detected w25q32dw with page size 256 Bytes, erase size 4 KiB, total 4 MiB
Net:     eth0: neta@30000 [PRIME]
Hit any key to stop autoboot:   0
```

Please press "ENTER" key when the above message is displayed.

```
Marvell>>
```

Enter the following in order. (**Blue** letter part)

```
Marvell>> run bootusb
starting USB...
USB0:     Register 2000104 NbrPorts 2
Starting the controller
    《 (skip)
Ubuntu 14.04 LTS localhost.localdomain ttyMV0

localhost login: root (automatic login)

 Last login: Thu Jan    1 00:00:20 UTC 1970 on ttyMV0
Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 4.4.8-armada-17.02.2-g8148be9-dirty aarch64)
```

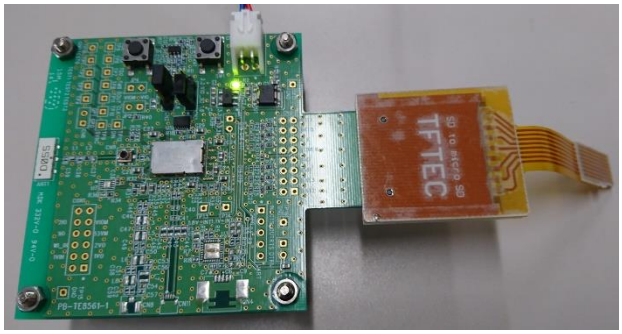
When the ESPRESSObin starts normally, you can check above message.

“bootusb” works with SDIO 3.0. (ultra-high speed)
If you want to operate with SDIO 2.0 (high speed), please change to "bootusbH". (**run bootusbH**)
Refer to “6. About SDIO switching” for setting on the evaluation board.

4. Load WLAN and Bluetooth driver

root@localhost:~# **cd /home/8887/bin_sd8887**
root@localhost:/home/8887/bin_sd8887# **insmod mlan.ko**
root@localhost:/home/8887/bin_sd8887# **insmod sd8887.ko cal_data_cfg=none**
[169.071741] wlan: Loading MWLAN driver
[169.076218] wlan: Driver loaded successfully
root@localhost:/home/8887/bin_sd8887# **cd ../bin_sd8887_bt/**
root@localhost:/home/8887/bin_sd8887_bt# **insmod bt8887.ko**
[178.215970] BT: Loading driver
[178.219525] BT: Driver loaded successfully
root@localhost:/home/8887/bin_sd8887_bt#

Turn on the power of the 88w8887 evaluation board and insert it into SDIO of ESPRESSObin.



Turn on the power of evaluation board and insert it in SD-Converter.

Insert it in microSD slot of ESPRESSObin.

The evaluation board will be recognized and the following message will be displayed.

root@localhost:/home/8887/bin_sd8887_bt# [68.499234] vendor=0x02DF device=0x9135 class=0 function=1
[68.504945] SDIO: max_segs=128 max_seg_size=65536
[68.509804] rx_work=1 cpu_num=2
[68.524226] Request firmware: mrvl/sd8887_uapsta_a2.bin
[69.651638] ***WLAN FW is active***
[74.665275] wlan: version = SD8887-15.68.7.p189-C4X15C605-GPL-(FP68)
[74.673418] ahci-mvebu d00e0000.sata: couldn't get PHY in node sata: -517
[74.696088] orion-ehci d005e000.usb: init d005e000.usb fail, -517
[74.721036] ahci-mvebu d00e0000.sata: couldn't get PHY in node sata: -517
root@localhost:/home/8887/bin_sd8887_bt#

When the driver install succeed, you can check “WLAN FW is active” message.
*If “WLAN FW is active” is not displayed, remove the evaluation board from the SD slot, turn the power of the evaluation board on again, and insert it in the SD slot again.

4.1 WLAN operation check

Confirmation of wireless LAN interface

```
root@localhost:/home/8887/bin_sd8887_bt# iwconfig
mlan0     IEEE 802.11-DS  ESSID:""
          Mode:Managed  Access Point: Not-Associated   Bit Rate:1 Mb/s
          Tx-Power=17 dBm
          Retry limit:9   RTS thr=2347 B   Fragment thr=2346 B
          Encryption key:off
          Power Management:on
          Link Quality=0/5  Signal level=0 dBm  Noise level=0 dBm
          Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0
          Tx excessive retries:0  Invalid misc:0   Missed beacon:0

wfd0      IEEE 802.11-DS  ESSID:""
          Mode:Managed  Access Point: Not-Associated   Bit Rate:1 Mb/s
          Tx-Power=17 dBm
          Retry limit:9   RTS thr=2347 B   Fragment thr=2346 B
          Encryption key:off
          Power Management:on
          Link Quality=0/5  Signal level=0 dBm  Noise level=0 dBm
          Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0
          Tx excessive retries:0  Invalid misc:0   Missed beacon:0

uap0      IEEE 802.11-DS  ESSID:""
          Mode:Master  Frequency:2.437 GHz  Access Point: Not-Associated
          Encryption key:off
          Link Quality:0  Signal level:0  Noise level:0
          Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:0
          Tx excessive retries:0  Invalid misc:0   Missed beacon:0
```

Perform a “scan”

```
root@localhost:/home/8887/bin_sd8887_bt# iwlist mlan0 scan
mlan0     Scan completed :
          Cell 01 - Address: 1C:**:**:**:**:**
                    ESSID:"WG1400HP-2G" [4]
                    Mode:Master
                    Frequency=2.417 GHz (Channel 2)
                    Quality:5/5  Signal level:-45 dBm  Noise level:-96 dBm
                    Encryption key:on
                    Bit Rates:1 Mb/s; 2 Mb/s; 5.5 Mb/s; 11 Mb/s; 6 Mb/s
                              9 Mb/s; 12 Mb/s; 18 Mb/s; 24 Mb/s; 36 Mb/s
                              48 Mb/s; 54 Mb/s
                    Extra:Beacon interval=100
                    IE: IEEE 802.11i/WPA2 Version 1
                        Group Cipher : CCMP
                        Pairwise Ciphers (1) : CCMP
                        Authentication Suites (1) : PSK

          Cell 02 - Address: 1C:**:**:**:**:**
                    ESSID:"WG1400HP-5G" [24]
                    Mode:Master
                    Frequency=5.18 GHz (Channel 36)
                    Quality:5/5  Signal level:-42 dBm  Noise level:-96 dBm
                    Encryption key:on
                    Bit Rates:6 Mb/s; 9 Mb/s; 12 Mb/s; 18 Mb/s; 24 Mb/s
                              36 Mb/s; 48 Mb/s; 54 Mb/s
                    Extra:Beacon interval=100
                    IE: IEEE 802.11i/WPA2 Version 1
                        Group Cipher : CCMP
                        Pairwise Ciphers (1) : CCMP
                        Authentication Suites (1) : PSK
```

Connection to Access Point

Access Point configuration example.

SSID="WG1400HP-5G"

passphrase="830420MUSEN"

```
root@localhost:/home/8887/bin_sd8887_bt#
    iwpriv mlan0 passphrase "1;ssid=WG1400HP-5G;passphrase=830420MUSEN"
mlan0       passphrase:1;ssid=WG1400HP-5G;passphrase=830420MUSEN
root@localhost:/home/8887/bin_sd8887_bt# iwconfig mlan0 essid WG1400HP-5G
root@localhost:/home/8887/bin_sd8887_bt# iwconfig mlan0
mlan0       IEEE 802.11-DS  ESSID:"WG1400HP-5G" [33]
            Mode:Managed  Frequency=5.18 GHz  Access Point: 1C:B1:7F:E4:82:23
            Bit Rate:433.5 Mb/s     Tx-Power=15 dBm
            Retry limit:9     RTS thr=2347 B     Fragment thr=2346 B
            Encryption key:****-****-****-****-****-****-****-****-****-****-****-****-****-****-****-****-****-
****-****-****-****-****-****-****-****-****-****-****     Security mode:restricted     Security mode:open
            Power Management:on
            Link Quality=5/5  Signal level=-42 dBm  Noise level=-93 dBm
            Rx invalid nwid:0  Rx invalid crypt:0  Rx invalid frag:1114
            Tx excessive retries:0  Invalid misc:0     Missed beacon:0
```

Set IP address and "ping"

```
root@localhost:/home/8887/bin_sd8887_bt# dhclient mlan0
root@localhost:/home/8887/bin_sd8887_bt# ifconfig mlan0
mlan0       Link encap:Ethernet  HWaddr ac:3f:a4:84:d1:88
            inet addr:192.168.10.12  Bcast:192.168.10.255  Mask:255.255.255.0
            UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
            RX packets:7 errors:0 dropped:0 overruns:0 frame:0
            TX packets:6 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1000
            RX bytes:1840 (1.8 KB)  TX bytes:2052 (2.0 KB)

root@localhost:/home/8887/bin_sd8887_bt# ping 192.168.10.1 (*Access Point IP address)
PING 192.168.10.1 (192.168.10.1) 56(84) bytes of data.
64 bytes from 192.168.10.1: icmp_seq=1 ttl=255 time=2.88 ms
64 bytes from 192.168.10.1: icmp_seq=2 ttl=255 time=1.33 ms
```

4.2 Bluetooth operation check

Confirmation of wireless Bluetooth interface

```
root@localhost:/home/8887/bin_sd8887_bt# hciconfig
hci0:   Type: BR/EDR   Bus: SDIO
        BD Address: AC:3F:A4:84:D1:89   ACL MTU: 1021:7   SCO MTU: 120:6
        UP RUNNING PSCAN
        RX bytes:918 acl:0 sco:0 events:42 errors:0
        TX bytes:1182 acl:0 sco:0 commands:42 errors:0
```

Perform a “inquiry” and “connection”

```
root@localhost:/home/8887/bin_sd8887_bt# hcitool -i hci0 scan
Scanning ...
        XX:D2:24:BA:9C:02       n/a
        XX:E0:10:E2:48:89       n/a
        XX:CB:57:6A:9A:5C       n/a
        E4:A7:A0:4A:C7:42       H00028472-PC

root@localhost:/home/8887/bin_sd8887_bt# hcitool -i hci0 cc E4:A7:A0:4A:C7:42
root@localhost:/home/8887/bin_sd8887_bt# hcitool -i hci0 con
Connections:
        < ACL E4:A7:A0:4A:C7:42 handle 1 state 1 lm SLAVE
```

4.3 wpa_supplicant operation check

```
root@localhost:/home/8887/bin_sd8887_bt# cd /home/wpa_supplicant/
root@localhost:/home/wpa_supplicant# wpa_supplicant -Dwext -imlan0 -c ./wpa01.conf
Successfully initialized wpa_supplicant
rfkill: Cannot open RFKILL control device
ioctl[SIOCSIWESSID]: Bad address
mlan0: Trying to associate with 1c:b1:7f:e4:82:22 (SSID='WG1400HP-2G' freq=2417 MHz)
mlan0: Associated with 1c:b1:7f:e4:82:22
mlan0: WPA: Key negotiation completed with 1c:b1:7f:e4:82:22 [PTK=CCMP GTK=CCMP]
mlan0: CTRL-EVENT-CONNECTED - Connection to 1c:b1:7f:e4:82:22 completed [id=0 id_str=]
```

*Please create "conf" file according to your environment and use it.

4.4 hostapd operation check

Confirmation of hostapd is done by loading WLAN driver.

root@localhost:~# **cd /home/hostapd/bin_sd8887_hostapd/**

root@localhost:/home/hostapd/bin_sd8887_hostapd# **insmod mlan.ko**

root@localhost:/home/hostapd/bin_sd8887_hostapd# **insmod sd8887.ko cal_data_cfg=none**

[48.945206] wlan: Loading MWLAN driver

[48.950034] wlan: Driver loaded successfully

root@localhost:/home/hostapd/bin_sd8887_hostapd# [67.816250] vendor=0x02DF device=0x9135 class=0 function=1

[67.821827] SDIO: max_segs=128 max_seg_size=65536

[67.826581] rx_work=1 cpu_num=2

[67.833097] Request firmware: mrvl/sd8887_uapsta_a2.bin

[68.959540] ***WLAN FW is active***

[73.962215] creating custom regulatory domain failed

[73.990290] wlan: version = SD8887-15.68.7.p189-C4X15C605-GPL-(FP68)

[73.998035] orion-ehci d005e000.usb: init d005e000.usb fail, -517

[74.006669] ahci-mvebu d00e0000.sata: couldn't get PHY in node sata: -517

[74.049723] orion-ehci d005e000.usb: init d005e000.usb fail, -517

[74.057792] ahci-mvebu d00e0000.sata: couldn't get PHY in node sata: -517

*Please create "conf" file according to your environment and use it.

root@localhost:/home/hostapd/bin_sd8887_hostapd# **cd ..**

root@localhost:/home/hostapd# **hostapd ./test_hostapd.conf**

Configuration file: ./test_hostapd.conf

rfkill: Cannot open RFKILL control [246.128457] get_channel when AP is not started device

[246.137962] get_channel when AP is not started

[246.143303] get_channel when AP is not started

uap0: interface state UNINITIALIZED->COUNTRY_UPDATE

Using interface uap0 with hwaddr ac:3f:a4:84:d2:88 and ssid "ESP_AP_test"

[246.233170] wlan: Starting AP

[246.248426] wlan: AP started

[246.253711] Set AC=3, txop=47 cwmin=3, cwmax=7 aifs=1

[246.259356] Set AC=2, txop=94 cwmin=7, cwmax=15 aifs=1

[246.265744] Set AC=0, txop=0 cwmin=15, cwmax=63 aifs=3

[246.271371] Set AC=1, txop=0 cwmin=15, cwmax=1023 aifs=7

uap0: interface state COUNTRY_UPDATE->ENABLED

uap0: AP-ENABLED

uap0: STA e4:a7:a0:4a:c7:3e IEEE 802.11: associated ← Connection from client (station)

uap0: AP-STA-CONNECTED e4:a7:a0:4a:c7:3e

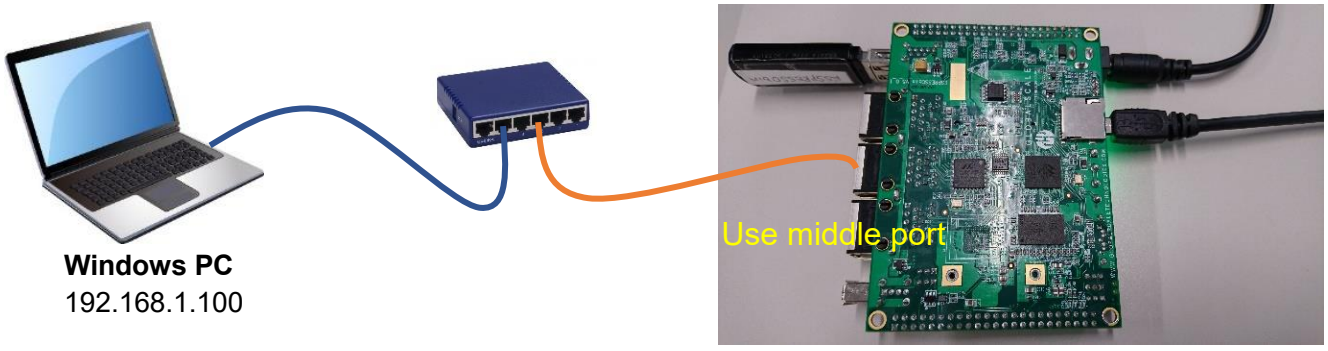
uap0: STA e4:a7:a0:4a:c7:3e RADIUS: starting accounting session 00000041-00000000

uap0: STA e4:a7:a0:4a:c7:3e WPA: pairwise key handshake completed (RSN)

5. Manufacturing utility (MFG)

*Please restart ESPRESSObin before MFG operation.

5.1 Wired network settings



Windows PC
192.168.1.100

root@localhost:~# **ifconfig eth0 up**
root@localhost:~# **ifconfig lan0 192.168.1.10 up**
You can set the IP address arbitrarily.

5.2 Load WLAN and Bluetooth driver with MFG firmware

root@localhost:~# **cd /home/8887/bin_sd8887**
root@localhost:/home/8887/bin_sd8887# **insmod mlan.ko**
root@localhost:/home/8887/bin_sd8887#
insmod sd8887.ko cal_data_cfg=none mfg_mode=1 fw_name=mrvl/sdio8887_sdio_combo.bin
[127.544784] wlan: Loading MWLAN driver
[127.552974] wlan: Driver loaded successfully
root@localhost:/home/8887/bin_sd8887# **cd ../bin_sd8887_bt/**
root@localhost:/home/8887/bin_sd8887_bt# **insmod bt8887.ko**
[287.204131] BT: Loading driver
[287.207515] BT: Driver loaded successfully

Turn on the power of the evaluation board and insert it into SDIO of ESPRESSObin.

root@localhost:/home/8887/bin_sd8887_bt#
[328.904607] vendor=0x02DF device=0x9135 class=0 function=1
[328.912467] SDIO: max_segs=128 max_seg_size=65536
[328.917119] rx_work=1 cpu_num=2
[328.925621] Request firmware: mrvl/sdio8887_sdio_combo.bin
[329.963455] WLAN FW is active
[329.985829] IOCTL failed: ffffffc038154800 id=0x20000, sub_id=0x20006 action=1, status_code=0x2
[329.994793] set mac address failed! status=-1, error_code=0x2
[330.011301] wlan: version = SD8887-0.0.0.p0-C4X15C605-GPL-(FP68)
[330.021305] ahci-mvebu d00e0000.sata: couldn't get PHY in node sata: -517
[330.030038] orion-ehci d005e000.usb: init d005e000.usb fail, -517
[330.053699] ahci-mvebu d00e0000.sata: couldn't get PHY in node sata: -517
[330.069738] orion-ehci d005e000.usb: init d005e000.usb fail, -517

5.3 Run “MFG Bridge” application

root@localhost:/home/8887/bin_sd8887_bt# **cd ../bin_mfgbridge/**
root@localhost:/home/8887/bin_mfgbridge# **./mfgbridge**
UART: initialize ...
Can't get port settings: Input/output error
NET: initialize ...
NET: socket bind is completed!
NET: initialization is completed.
NET: server port: 9930
NET: client port: 9931

Execute "DutApi_w8887_BrdigeEth.exe" on the Windows PC side.
(Please refer to " 8887_MFG_Bridge_User_Guide" for details. It can be download from the following.
https://www.yuden.co.jp/ut/product/category/module/lineup.html#WLAN)

NET: new connection from 192.168.1.100
Initialize drvwrapper ....
no nfc /dev/mnfcchar0no nfc /dev/mfmchar0Initialize drvwrapper for BT ....
DRV: driver is initialized.
NET: socket FD = 5
NET: receive a packet (bytes = 40
BRDG: process Rx msg ...
NET: WLAN command.
DRV: send host cmd thr ioctl
DRV: host cmd is completed
NET: send a msg.
NET: the msg is sent.
NET: socket FD = 5
NET: receive a packet (bytes = 36
BRDG: process Rx msg ...
NET: WLAN command.
DRV: send host cmd thr ioctl
DRV: host cmd is completed
NET: send a msg.
NET: the msg is sent.
NET: socket FD = 5
NET: receive a packet (bytes = 0
NET: close client socket
De-Initialize drvwrapper for BT....
De-Initialize drvwrapper ....
NET: socket FD = 4
NET: new connection from 192.168.1.100
Initialize drvwrapper ....
no nfc /dev/mnfcchar0no nfc /dev/mfmchar0Initialize drvwrapper for BT ....
DRV: driver is initialized.
NET: socket FD = 5
NET: receive a packet (bytes = 16
BRDG: process Rx msg ...
HCI Command
Rx Event E for 09 10
In Cmd 09 10
NET: send a msg.
NET: the msg is sent.

```
Name:           Dut labtool
Version:        2.0.0.96
Date:           May  2 2017 (11:53:53)

Note:

1. =========WiFi tool=============
2. =========BT   tool=============
3. =========FM   tool=============
4. =========NFC  tool=============

Enter CMD 99 to Exit

Enter option: 1
```

```
Enter option: 1
Name:           DutApiClass
Interface:      EtherNet
Version:        2.0.0.96
Date:           May  2 2017 (11:53:34)

Note:

C:¥Users¥jt0011083¥Downloads¥ESPRESSObin¥MFG-W8887-MF-WIFI-BT-FM-BRG-FC-WIN-X86-2.0.0.96-15.2.7.p123¥bin¥relea
¥setup.ini
Dut's IP 192.168.1.10:9930
Host's IP 192.168.1.100:9931
DutIf_UdpIp::delay 0
DutIf_UdpIp::vg_IfSpy 0
TCP connecting...
 DutIf_InitConnection: 0
------------------------------------------------------
               W87xx (802.11a/g/b/n/ac) TEST MENU
------------------------------------------------------
Enter option:
```

```
------------------------------------------------------
               W87xx (802.11a/g/b/n/ac) TEST MENU
------------------------------------------------------
Enter option: 45
 DutIf_GetMACAddress: 0x00000000
 DutIf_GetMACAddress: ac.3f.a4.84.d1.88
Enter option:
```

```
Enter option: 99
Exiting
 DutIf_Disconnection: 0
1. =========WiFi tool=============
2. =========BT   tool=============
3. =========FM   tool=============
4. =========NFC  tool=============

Enter CMD 99 to Exit

Enter option: 2
Name:           DutApiClass
Interface:      Version:        2.0.0.96
Date:           May  2 2017 (11:53:36)

Note:

C:¥Users¥jt0011083¥Downloads¥ESPRESSObin¥MFG-W8887-MF-WIFI-BT-FM-BRG-FC-WIN-X86-2.0.0.
¥setup.ini
Dut's IP 192.168.1.10:9930
Host's IP 192.168.1.100:9931
DutIf_UdpIp::delay 0
DutIf_UdpIp::vg_IfSpy 0
TCP connecting...
 Dut_Bt_OpenDevice: 0x00000000
------------------------------------------------------------------------
               W87xx (BT) TEST MENU
------------------------------------------------------------------------
Enter option: 45
45

 Dut_Bt_GetBDAddress: 0x00000000
BD_ADDRESS: AC-3F-A4-84-D1-89
Enter option:
```

6. About SDIO switching

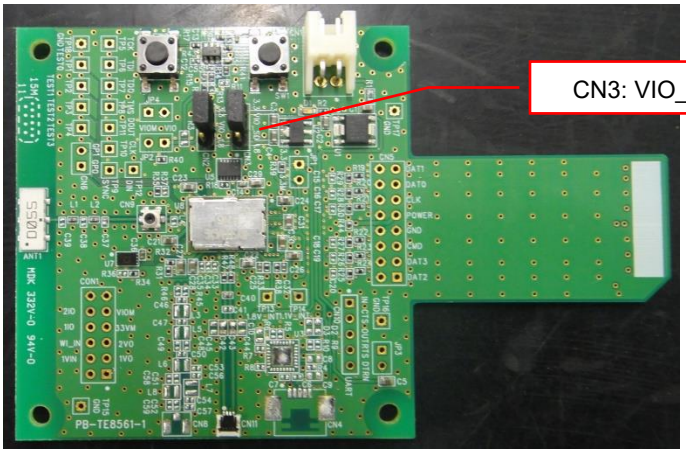
This is the setting of SDIO bus speed switching on each evaluation board.

CN3: VIO_SD Voltage Select

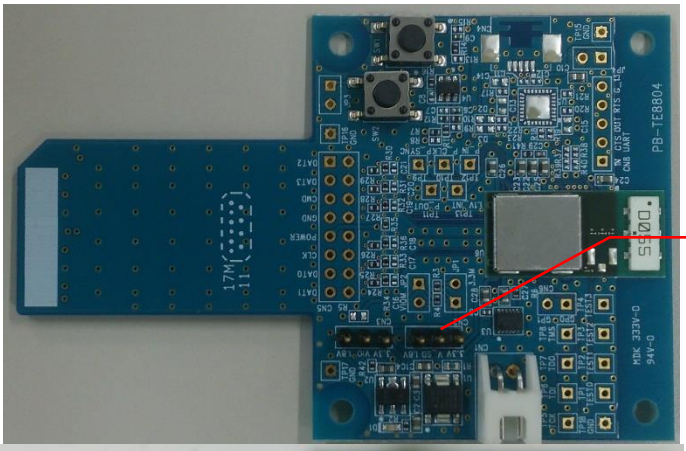
No.	Pin name	Direction	Description
1	3.3V	Output	3.3V output. (high speed)
2	VIO	Input	Input for VIO_SD.
3	1.8V	Output	1.8V output. (ultra-high speed)

Setting: 1-2 short -> high speed

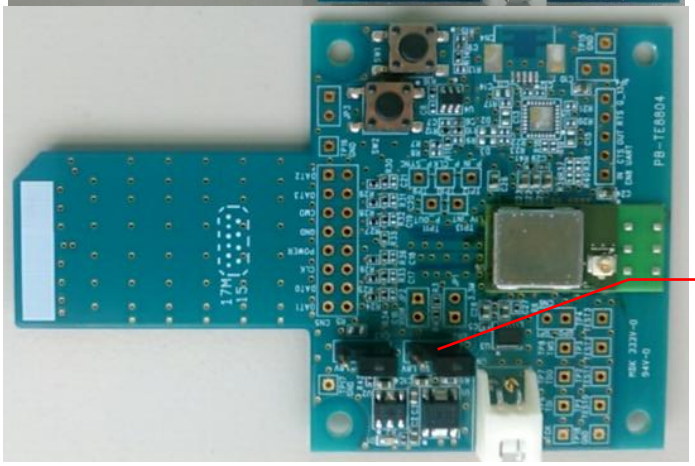
Setting: 2-3 short -> ultra-high speed



WBSBHVGXG



WBSAGVDXG



WBSEGVDXG