About a plan for prototype of switch for array sensors

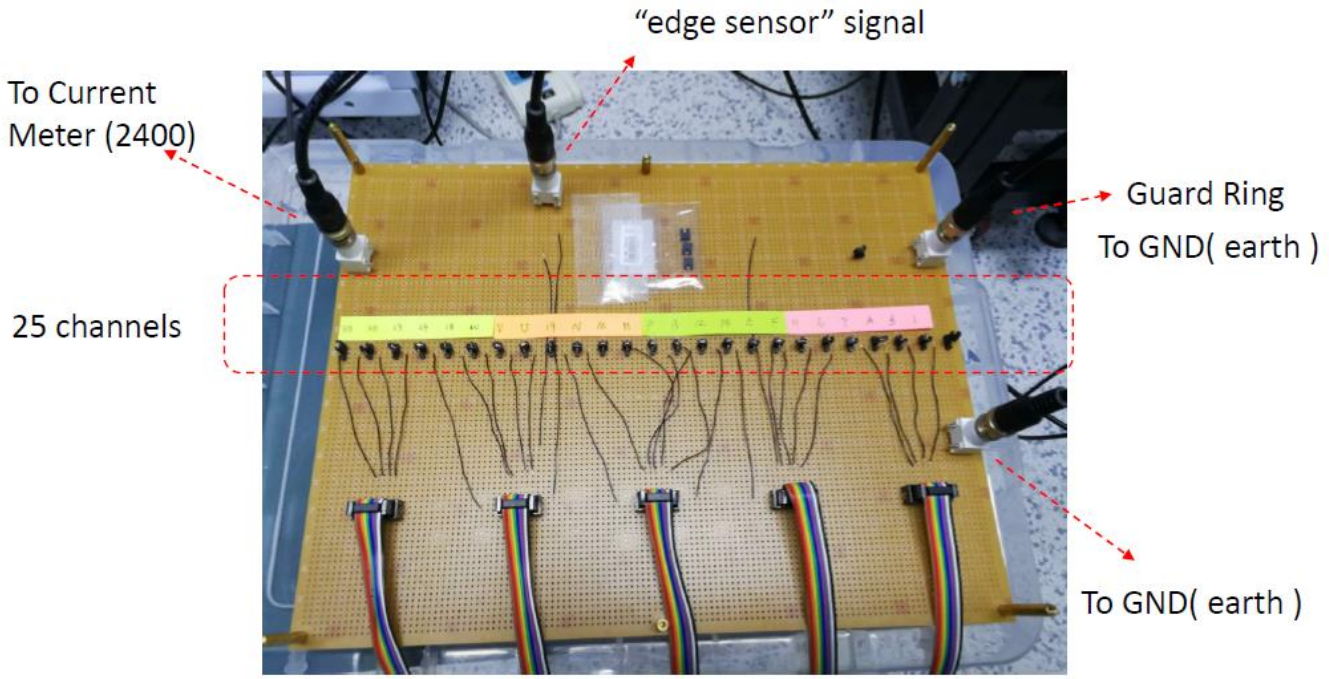
02/28/2019

Channel Switcher

Now we have to switch each channel by manual

Not only the procedure is not effective at all, but also it is difficult to adopt this way for 15x15 array

Switching channels -- manually



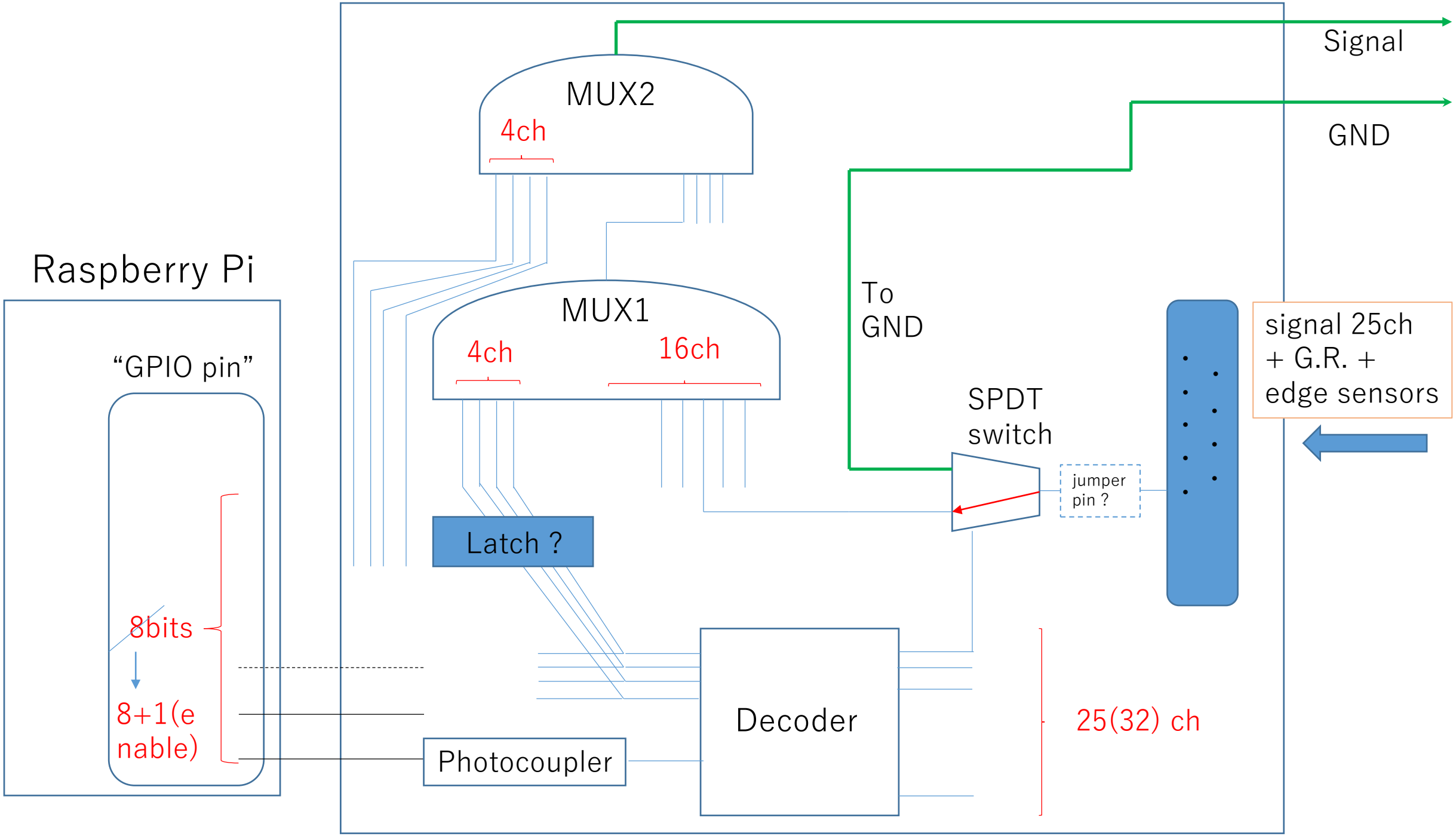
from past slide

A plan for programmable switch

-- Combination of Raspberry PI and a PCB on which MUX(multiplexer IC)s are mounted.
(Rough idea is in the next page)

-- Should be divided into several steps so that we do not lose time.

- 1. check the resolution
- 2. small prototype PCB , for example, 8 ch only.
- 3. prototype of 5x5 channels

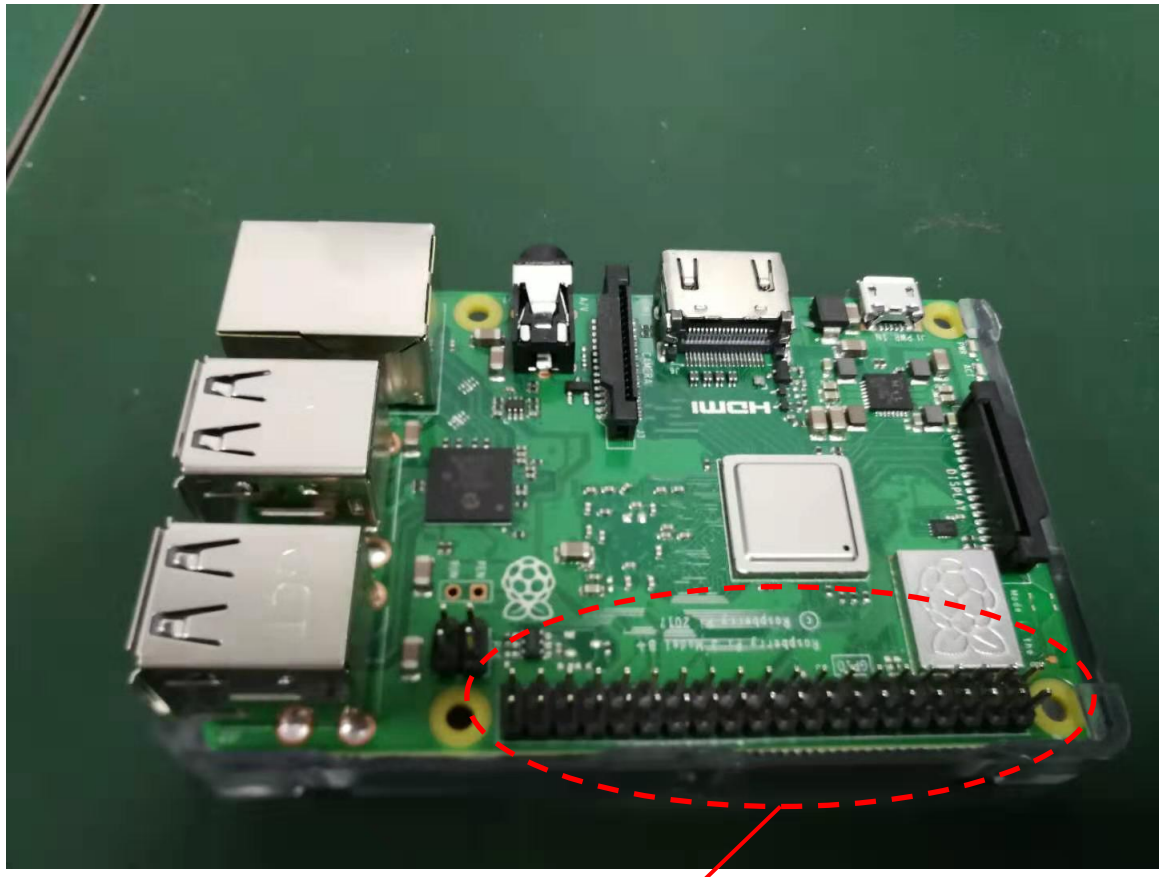

Signal
GND
MUX2
4ch
MUX1
4ch
16ch
Raspberry Pi
"GPIO pin"
To
GND
SPDT
switch
jumper
pin ?
signal 25ch
+ G.R. +
edge sensors
Latch ?
8bits
8+1(e
nable)
Decoder
Photocoupler
25(32) ch

Raspberry Pi

-- Raspberry PI 3B+

-- Install Linux , for now thinking to install so called “Raspbian” (based on Debian)

-- GPIO pins (except some of already assigned ones) can be used as digital output pins, thus, can control the system from this linux.



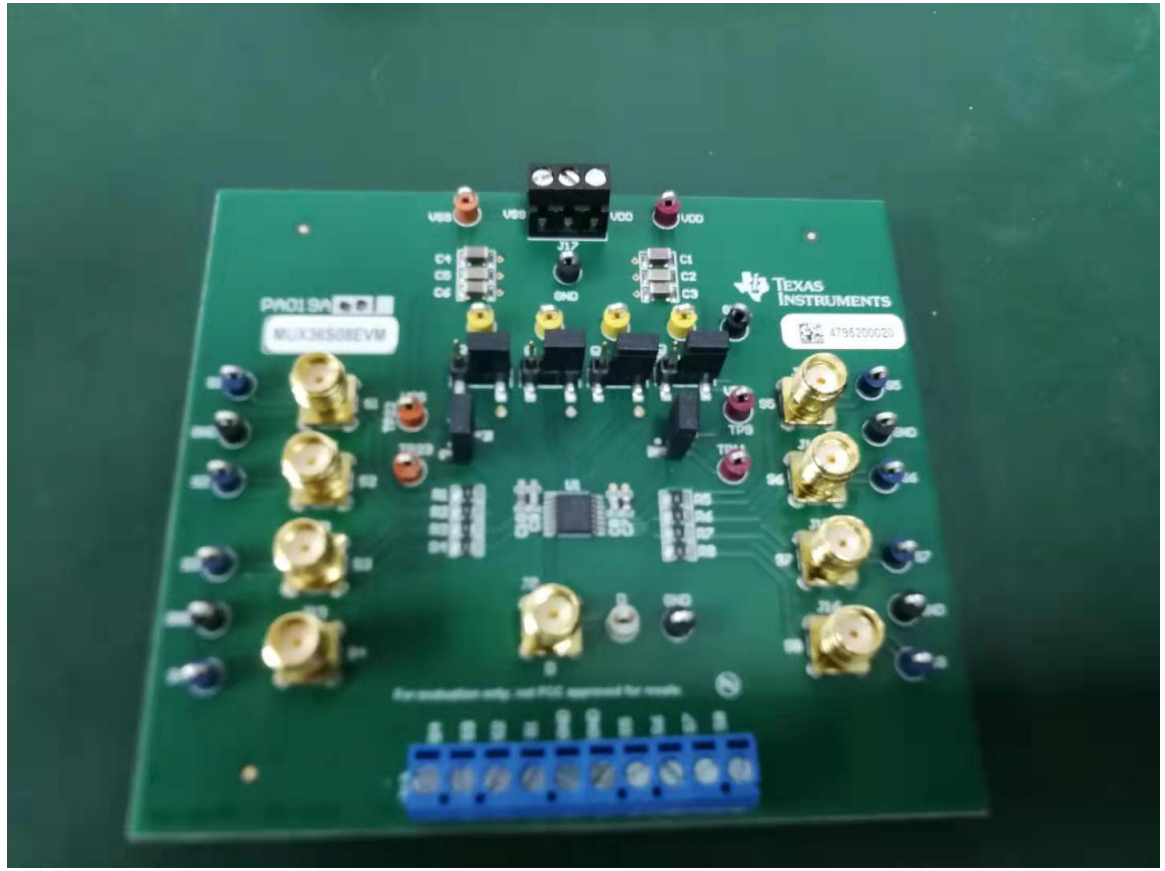
Multiplexer evaluation board

-- MUX36S08EVM-PDK

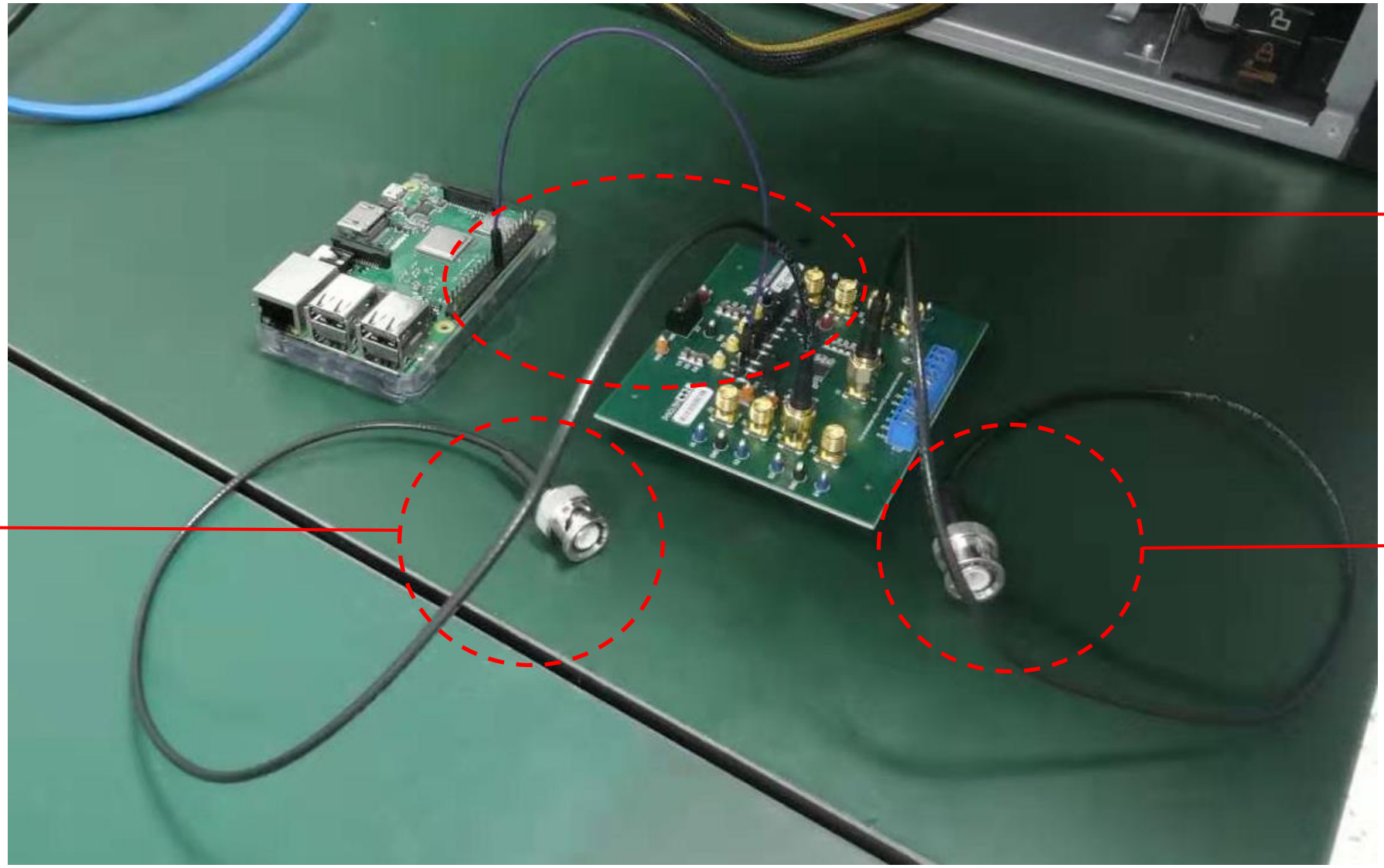
-- Evaluation board for the multiplxer “MUX36S08” (low noise MUX)

-- 8ch in ---> 1 ch out

-- P.S. is needed. --> preparing batteries considering P.S. noise.



(expected ..) Connection for a test



Step I.

1. Check the resolution

-- Connect (preparation) the P.S. to the evaluation board

-- See the resolution of the current by using a resistor and then a single LGAD

-- Install Linux on Raspberry PI

-- Play and check the control (output) of GPIO pins

-- Connect the both system, and re-measure the current.

Step II.

(continue from previous page)

-- Insert photo-coupler between the Raspberry Pi & evaluation board.

It is mentioned at many places that the digital signal from Raspberry PI introduces large noise, therefore, might need “isolation”.

2. If the resolution is somehow ok (now considering 1nA), try to make simple PCB design based on this evaluation board (+ more)