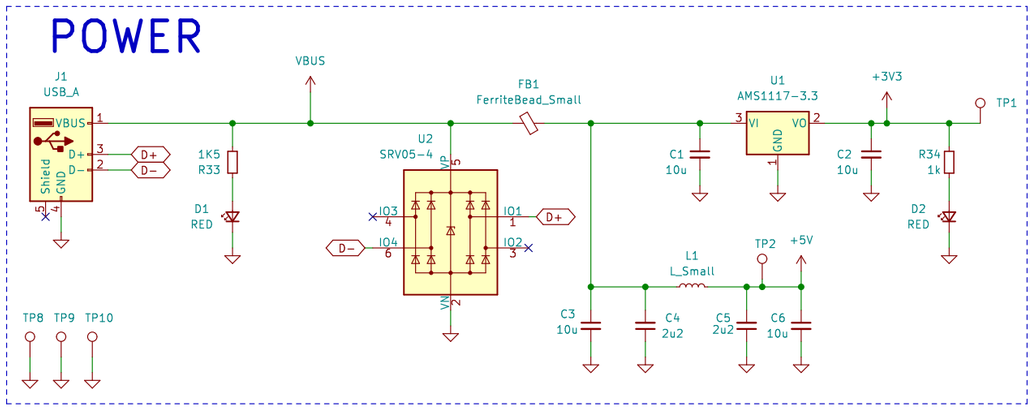
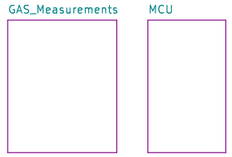
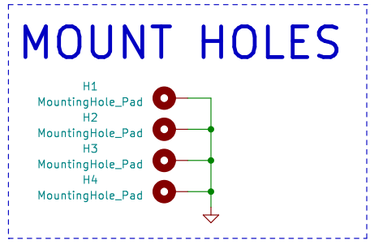
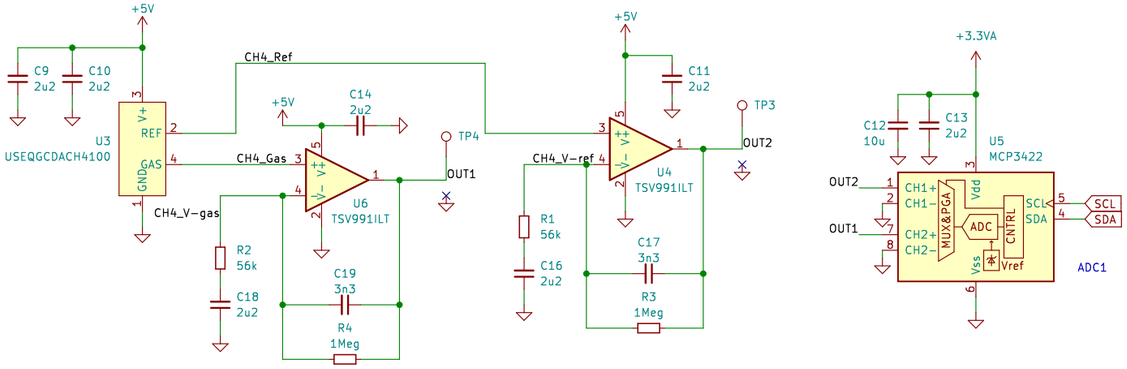




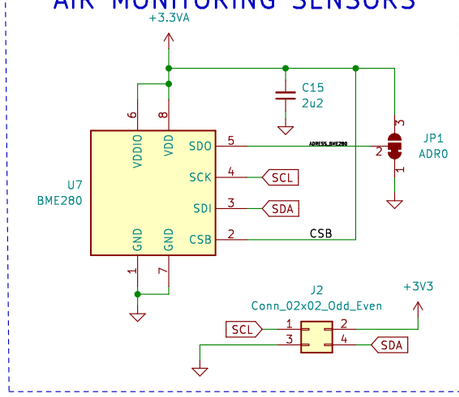


Sheet: /		
File: GMWPY.kicad_sch		
Title: Gas_sensor_board		
Size: A3	Date:	**Rev: 1**
KiCad E.D.A. kicad (6.0.9)		Id: 1/3

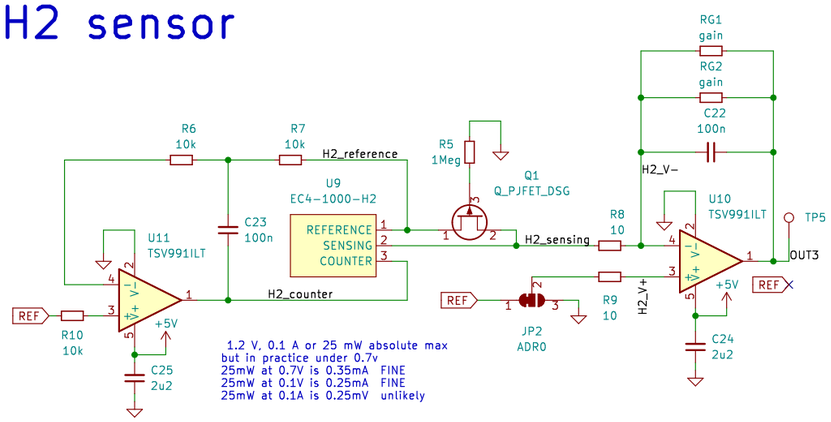
CH4 sensor

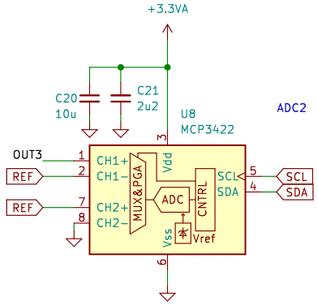


AIR MONITORING SENSORS

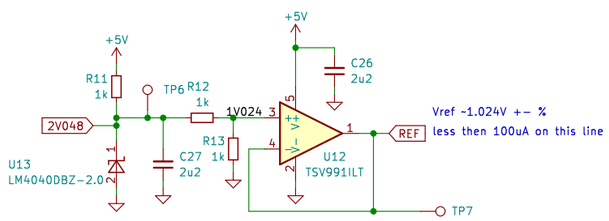


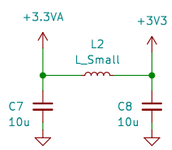
H2 sensor





GAIN MATH:
Transimpedance gain is RG in ohm
H2 10-30nA/ppm so (1-3)*10^-8 0-1000ppm with 2000ppm Maximum overload
Then :
IF RG =10k then (10^4)*(10^-8) V/ppm => 0.1-0.3 mV/ppm with 1-3V@ 1000ppm & 2-6v@ 2000ppm





Sheet: /GAS_Measurements/		
File: Measurements.kicad_sch		
Title:		
Size: A3	Date:	**Rev:**
KiCad E.D.A. kicad (6.0.9)		Id: 2/3

MCU

DANGER PINS

GPIO_3
GPIO_45
GPIO_46

U14
ESP32-S3-WROOM-1

ESP_BOOT 27 GPIO0/BOOT
ESP_EN 3 EN

GPIO_1 39 GPIO1/TOUCH1/ADC1_CH0
GPIO_2 38 GPIO2/TOUCH2/ADC1_CH1
GPIO_3 15 GPIO3/TOUCH3/ADC1_CH2
GPIO_4 4 GPIO4/TOUCH4/ADC1_CH3
GPIO_5 5 GPIO5/TOUCH5/ADC1_CH4
GPIO_6 6 GPIO6/TOUCH6/ADC1_CH5
GPIO_7 7 GPIO7/TOUCH7/ADC1_CH6
GPIO_8 12 GPIO8/TOUCH8/ADC1_CH7/SUBSPICS1
GPIO_9 17 GPIO9/TOUCH9/ADC1_CH8/FSPIHD/SUBSPIHD
GPIO_10 18 GPIO10/TOUCH10/ADC1_CH9/FSPICS0/FSPIII04/SUBSPICS0
GPIO_11 19 GPIO11/TOUCH11/ADC2_CH0/FSPID/FSPIII05/SUBSPID
GPIO_12 20 GPIO12/TOUCH12/ADC2_CH1/FSPICLK/FSPIII06/SUBSPICLK
GPIO_13 21 GPIO13/TOUCH13/ADC2_CH2/FSPIQ/FSPIII07/SUBSPIQ
GPIO_14 22 GPIO14/TOUCH14/ADC2_CH3/FSPIWP/FSPIDQS/SUBSPIWP
GPIO_15 8 GPIO15/U0RTS/ADC2_CH4/XTAL_32K_P
GPIO_16 9 GPIO16/U0CTS/ADC2_CH5/XTAL_32K_NH5
GPIO_17 10 GPIO17/U1TXD/ADC2_CH6
GPIO_18 11 GPIO18/U1RXD/ADC2_CH7/CLK_OUT3

GPIO20/U1CTS/ADC2_CH9/CLK_OUT1/USB_D+ 14 D+
GPIO19/U1RTS/ADC2_CH8/CLK_OUT2/USB_D- 13 D-

U0TXD/GPIO43/CLK_OUT1 37 GPIO_43
U0RXD/GPIO44/CLK_OUT2 36 GPIO_44
GPIO21 23 GPIO_21
GPIO45 26 GPIO_45
GPIO46 16 GPIO_46
GPIO48/SPICLK_N/SUBSPICLK_N_DIFF 25 GPIO_48
GPIO47/SPICLK_P/SUBSPICLK_P_DIFF 24 GPIO_47

SPIII06/GPIO35/FSPID/SUBSPID 28 GPIO_35
SPIII07/GPIO36/FSPICLK/SUBSPICLK 29 GPIO_36
SPIDQS/GPIO37/FSPIQ/SUBSPIQ 30 GPIO_37
GPIO38/FSPIWP/SUBSPIWP 31 GPIO_38
MTCK/GPIO39/CLK_OUT3/SUBSPICS1 32 GPIO_39
MTDO/GPIO40/CLK_OUT2 33 GPIO_40
MTDI/GPIO41/CLK_OUT1 34 GPIO_41
MTMS/GPIO42 35 GPIO_42

ESP32-S3-WROOM-1

3V3 2
GND 1

+3V3
C30 10u
C31 10u
C32 10u

+3V3 R14 10k
ESP_EN
100n C28
SW1 MCU_RESET

GPIO_9 R35 1k D3 RED
GPIO_8 R38 1k D4 RED

TP11 TP12 TP13
GPIO_43
GPIO_44

+3V3 R15 10k
ESP_BOOT
C29 2u2
SW2 MCU_RESET

+3V3 R39 10k
GPIO_16
100n C35
SW3 MCU_RESET

SD card

J4
Micro_SD_Card_Det

+3V3
C33 10u
C34 100n

DATA_2 1 DAT2
DATA_3 2 DAT3/CD
CMD 3 CMD
4 VDD
CLK 5 CLK
6 VSS
DATA_0 7 DAT0
DATA_1 8 DAT1
CARD_DETECT 10 DET_A
9 DET_B
SHIELD 11

+3V3
R20 10k
R21 10k
R22 10k
R23 10k
R24 10k
R25 10k
R26 10k

GPIO_42 10 R27 DATA_0
GPIO_41 10 R28 DATA_1
GPIO_1 10 R29 DATA_2
GPIO_2 10 R30 DATA_3
GPIO_43 10 R31 CMD
GPIO_44 10 R32 CLK
GPIO_40 CARD_DETECT

Pull UPs

+3V3
R16 DNP
R17 10k
R18 10k
R19 DNP
SCL
SDA
GPIO_5 SCL
GPIO_6 SDA

+3V3
R36 10k
R37 10k
GPIO_48
GPIO_47

Sheet: /MCU/	
File: MCU.kicad_sch	
Title:	
Size: A3	Date:
KiCad E.D.A. kicad (6.0.9)	**Rev:**
	Id: 3/3

J3
Conn_01x10
10 9 8 7 6 5