Nu_LB-002 Rev 2.0
User's Manual

1. Overview

The NUC1XX series are ARM® Cortex™-M0 core embedded microcontroller for industrial control and the applications which needed Rich communication functions. The Cortex™-M0 is the newest ARM embedded processor with 32-bit performance and at a cost equivalent traditional 8-bit microcontroller.
The NUC1XX series with Cortex™-M0 core runs up to 50MHz, up to 32K/64K/128K-byte embedded flash, and 4K/8K/16K-byte embedded SRAM, it also integrates Timers, Watchdog Timer, RTC, PDMA, UART, SPI/SSP, I2C, PWM Timer, GPIO, LIN, CAN, USB 2.0 FS Device, 12-bit ADC, Analog Comparator, Low Voltage Detector and Brown-out detector.

2. System Requirements

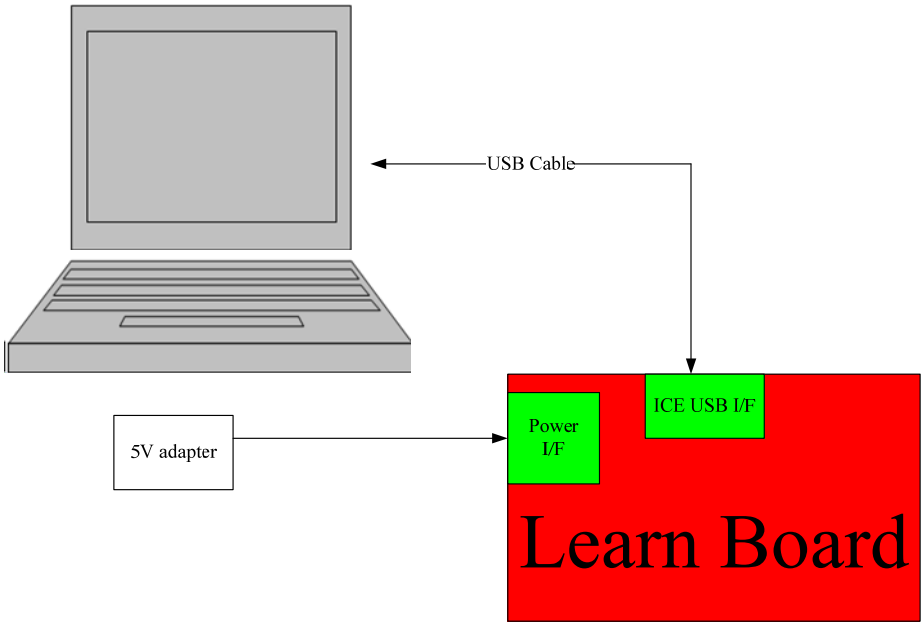
The PC running in Windows XP or Windows Vista.
KEIL RVMDK (V3.7 or later)
One available USB port

3. Software Setup.

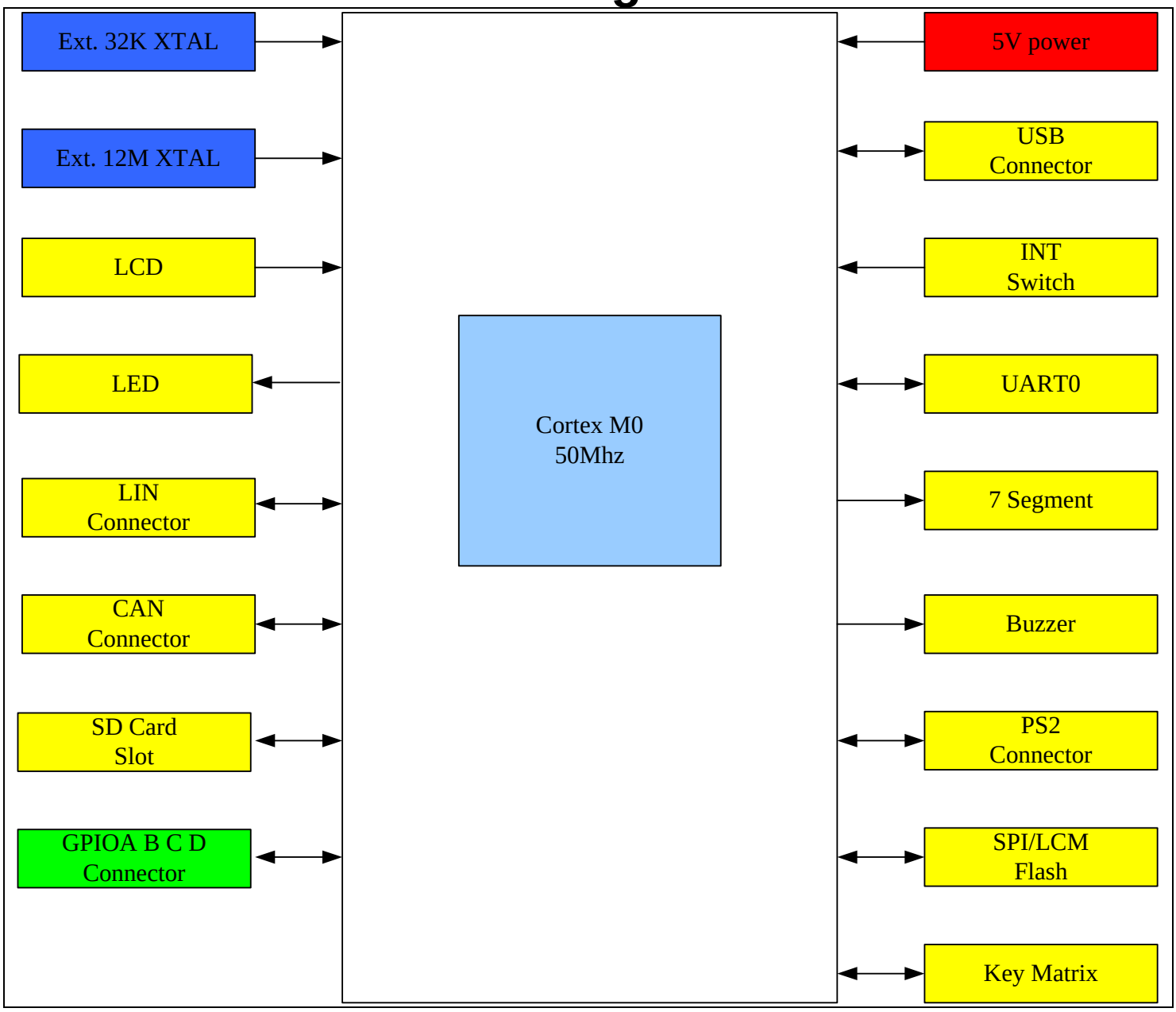
Install Nu-Link_Driver V1.01.

4. Hardware Setup

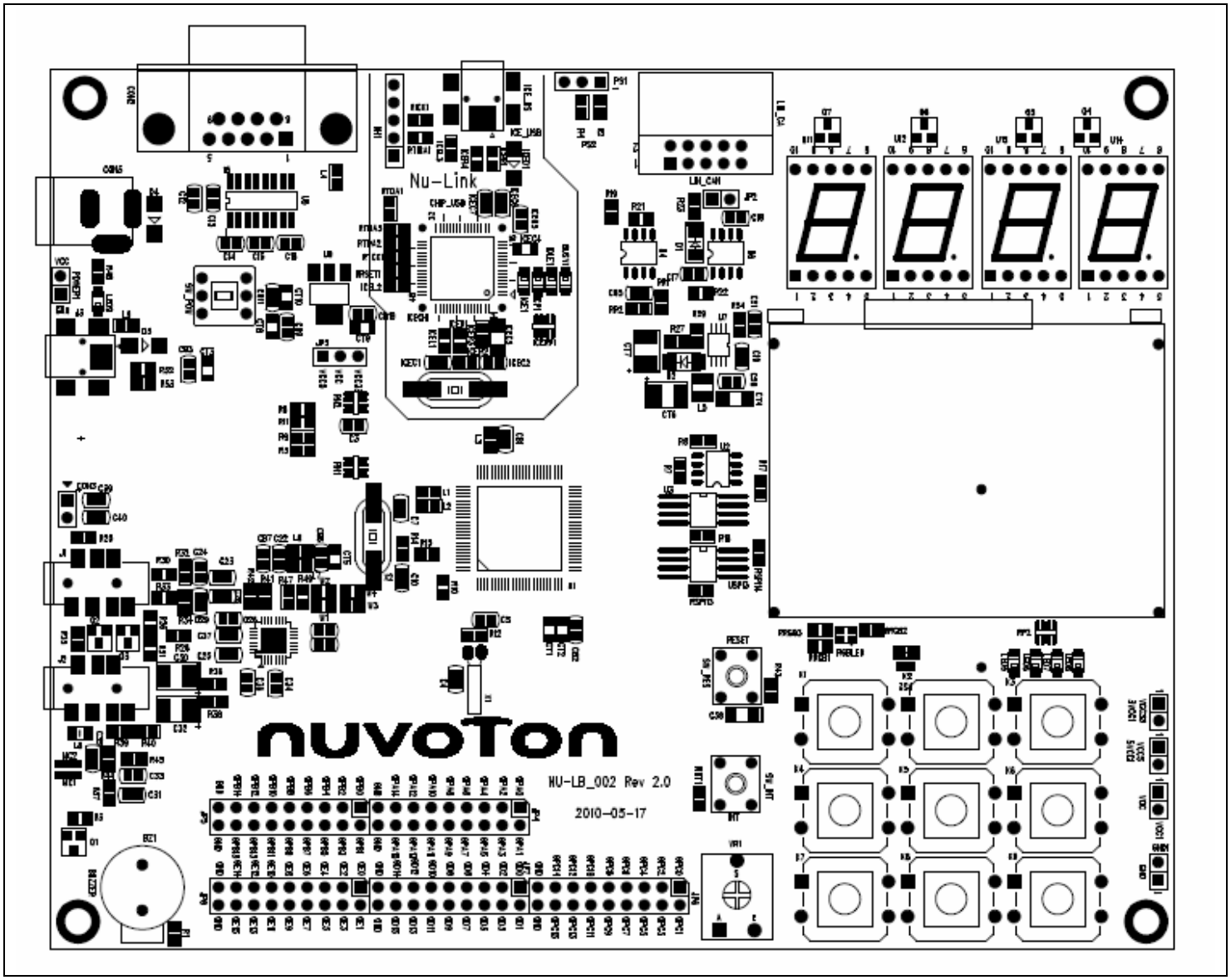
The Learn Board is connecting to a PC running the KEIL IDE via USB ICE as show in figure.
1, Connect the 5V power adapter to power jack on the learn board.
2, The PC's USB port to connect the ICE USB I/F.



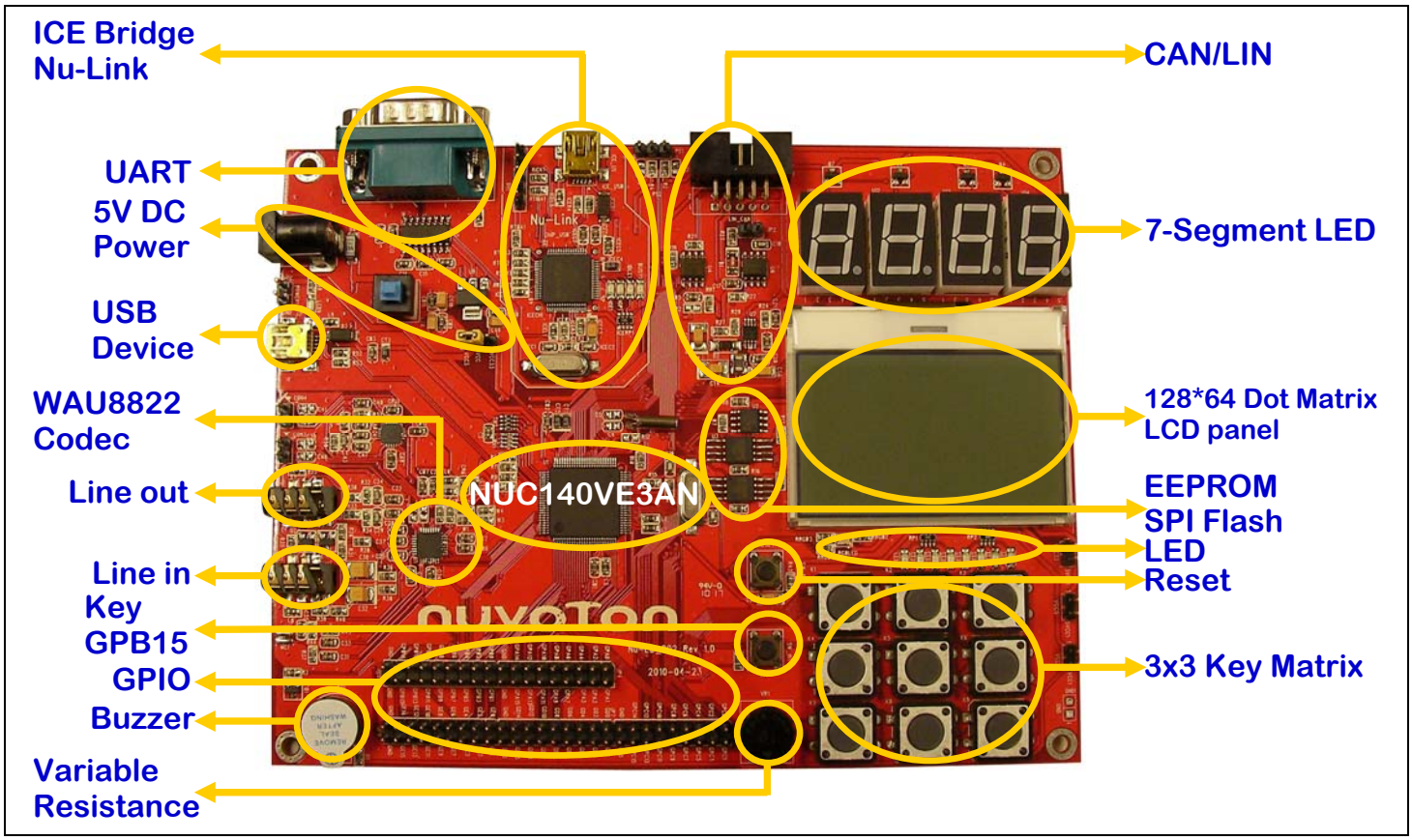
5. Learn Board Block Diagram



6. PCB Placement



7. Learning Board Introduction



8. Learning Board Pin Define

Block	Pin	Function
ICE Bridge Nu-Link	ICE_CLK ICE_DATA	SWD interface
UART	GPB0 GPB1	UART0 Rx UART0 Tx
WAU8822 codec	GPC0 GPC1 GPC2 GPC3 GPA15	I2SLRCLK I2SBCLK I2SDI I2SDO I2SMCLK
	GPA8 GPA9	I2C0 SDA I2C0 SCL
	GPE14	Line out Enable/Disable
	GPE15	Line in plug in/out detect
Key GPB15	GPB15	INT0
CAN	GPD6 GPD7	CAN0 Rx CAN0 Tx
	GPB12~13	CAN transceiver speed
LIN	GPB4 GPB5	UART1 Rx UART1 Tx
	GPB6	LIN transceiver wakeup function
	GPB7	LIN transceiver Enable/Disable
7-Seg LED	GPE0~7	Row
	GPC4~7	Column
Black Dot Matrix LCD Panel	GPD8 GPD9 GPD10 GPD11	SPI3 SS30 SPI3 SPCLK SPI3 MISO0 SPI3 MOSI0
	GPD14	LCD backlight power
Variable Resistance	GPA7	ADC interface
Buzzer	GPB11	PWM4
Key Matrix	GPA0~5	GPIO
Reset	RESET	Reset
EEPROM	GPA10 GPA11	I2C1 SDA I2C1 SCL
SD Slot	GPD12	SD power
	GPD13	SD card detect
	GPC8~11	SD interface
FLASH	GPD0 GPD1 GPD2 GPD3 GPD4 GPD5	SPI2 SS20 SPI2 SPCLK SPI2 MISO0 SPI2 MOSI0 SPI2 MISO1 SPI2 MOSI1
LED	GPA12 GPA13 GPA14	PWM0 PWM1 PWM2
	GPC12~15	GPIO

9. System Configuration

POWER ON Setting

CON5 : Power Jack + 5V DC IN
VCC: VCC power in/out
VCC5: 5VCC power in/out
VCC33:3VCC power in/out

JP3: System voltage

The LB board is support 3V for system.

Debug Connect

ICECON: USB connect to PC for debug NUC1XX.

USB Connect

J3 mini USB Connector for NCU1XX USB function.

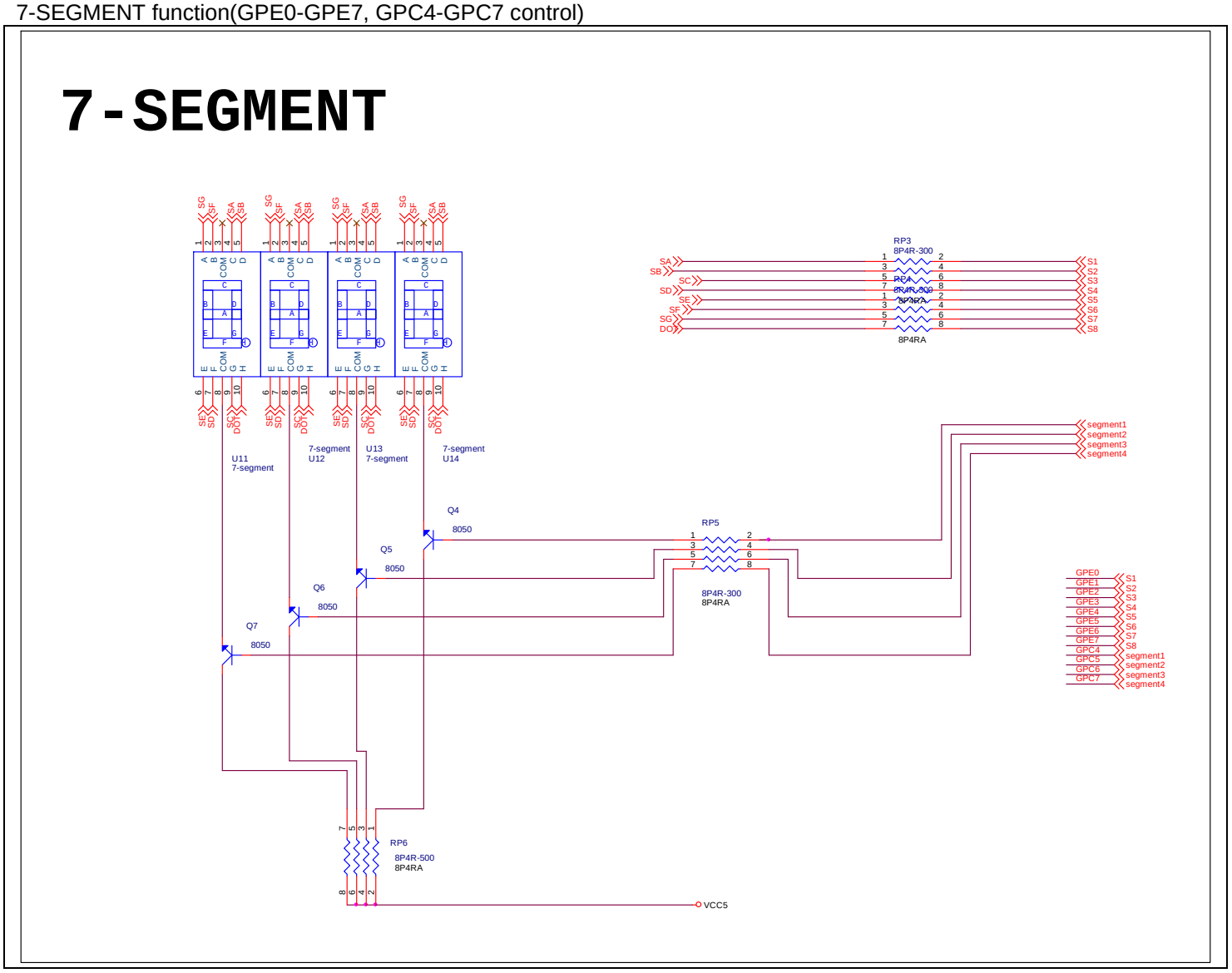
Reset

SW_RESET:Reset NCU140(low reset)

10. Function

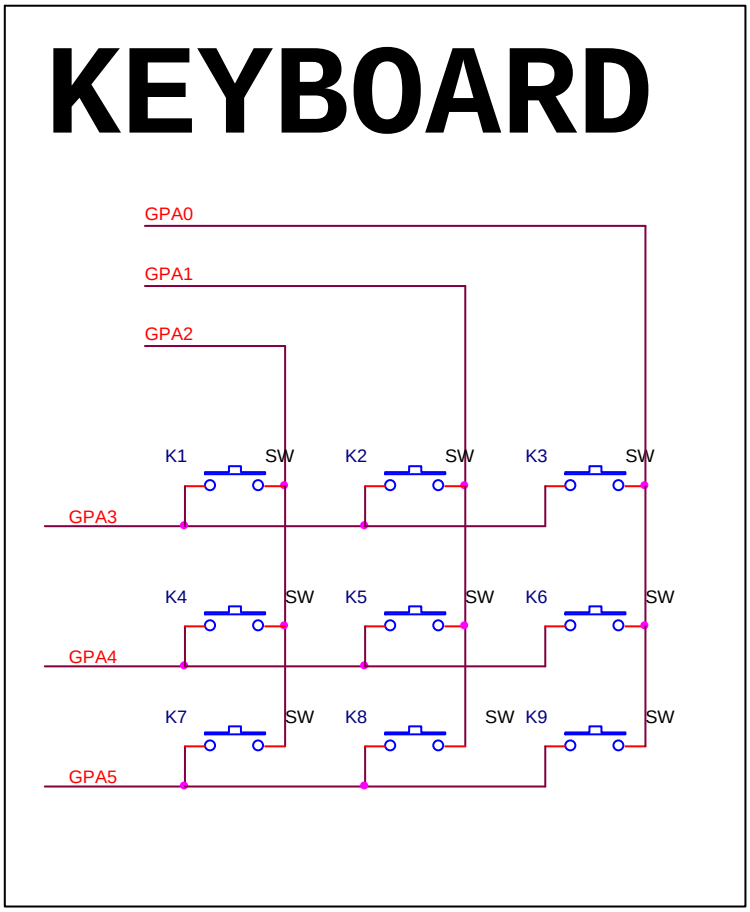
7-SEGMENT

7-SEGMENT function(GPE0-GPE7, GPC4-GPC7 control)



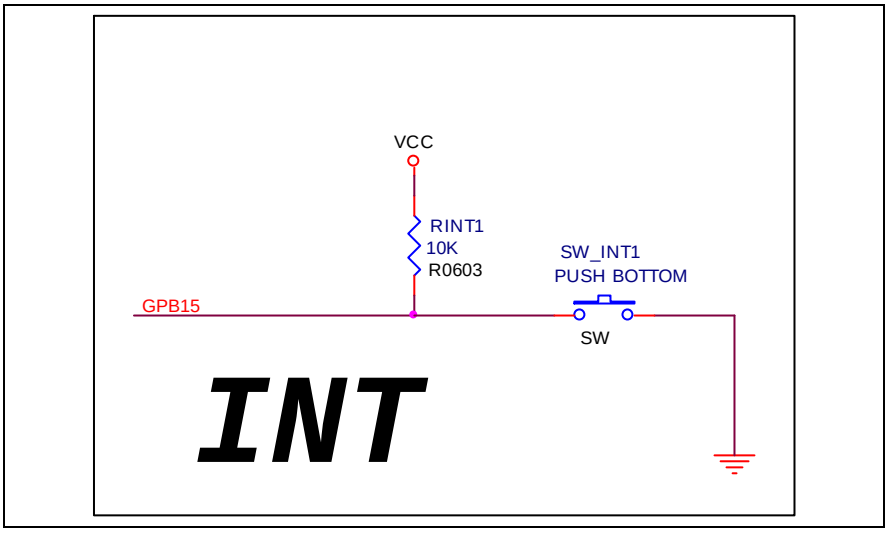
KEYBOARD

GPA0-GPA5 to control KEYBOARD function



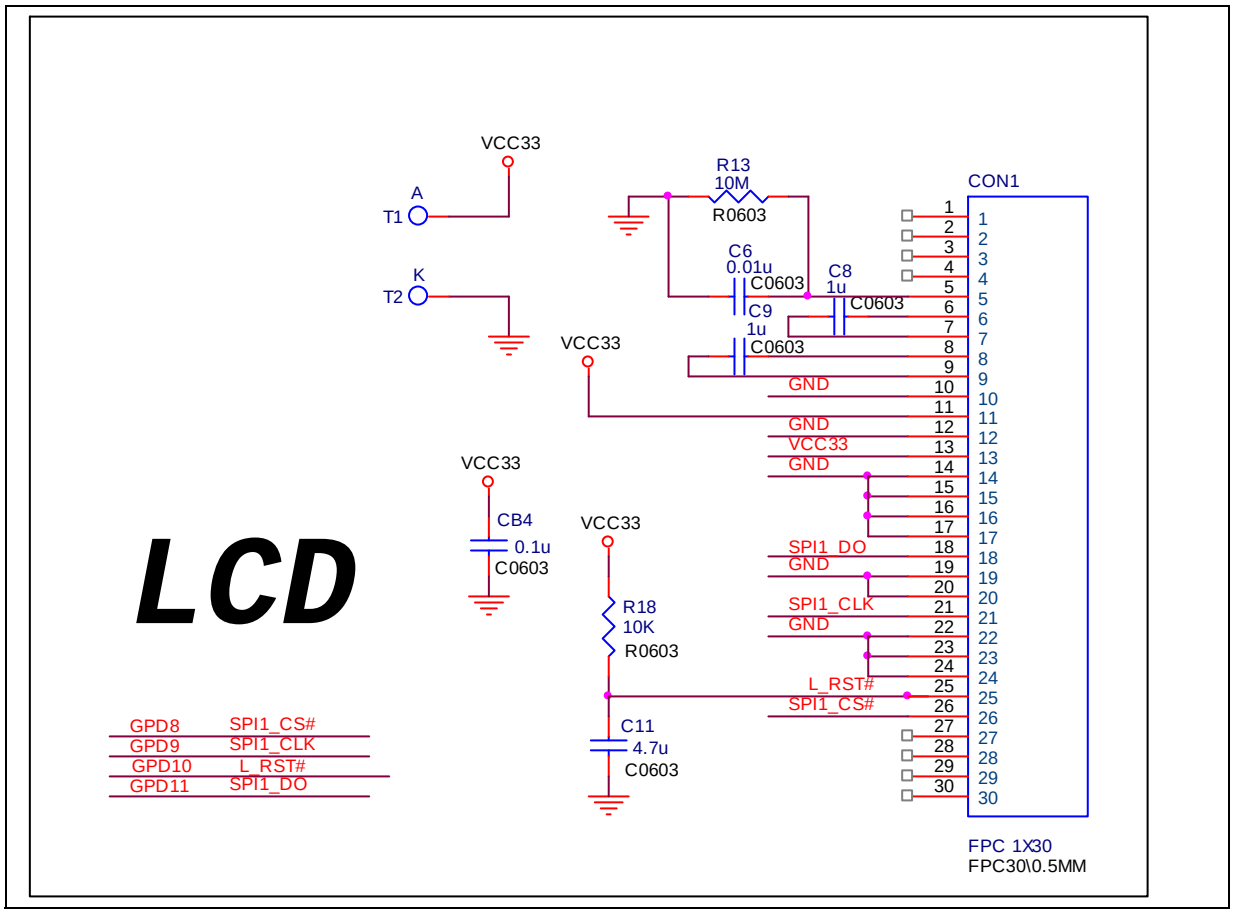
INT

SW_INT connect to GPB15



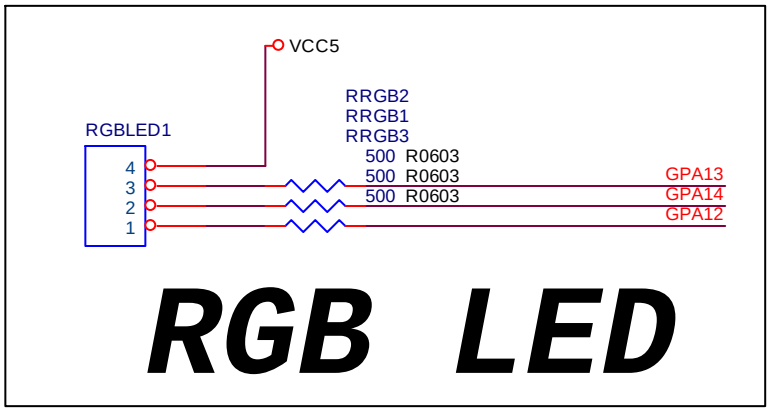
LCD

GPD8-GPD11 connect to LCD function.



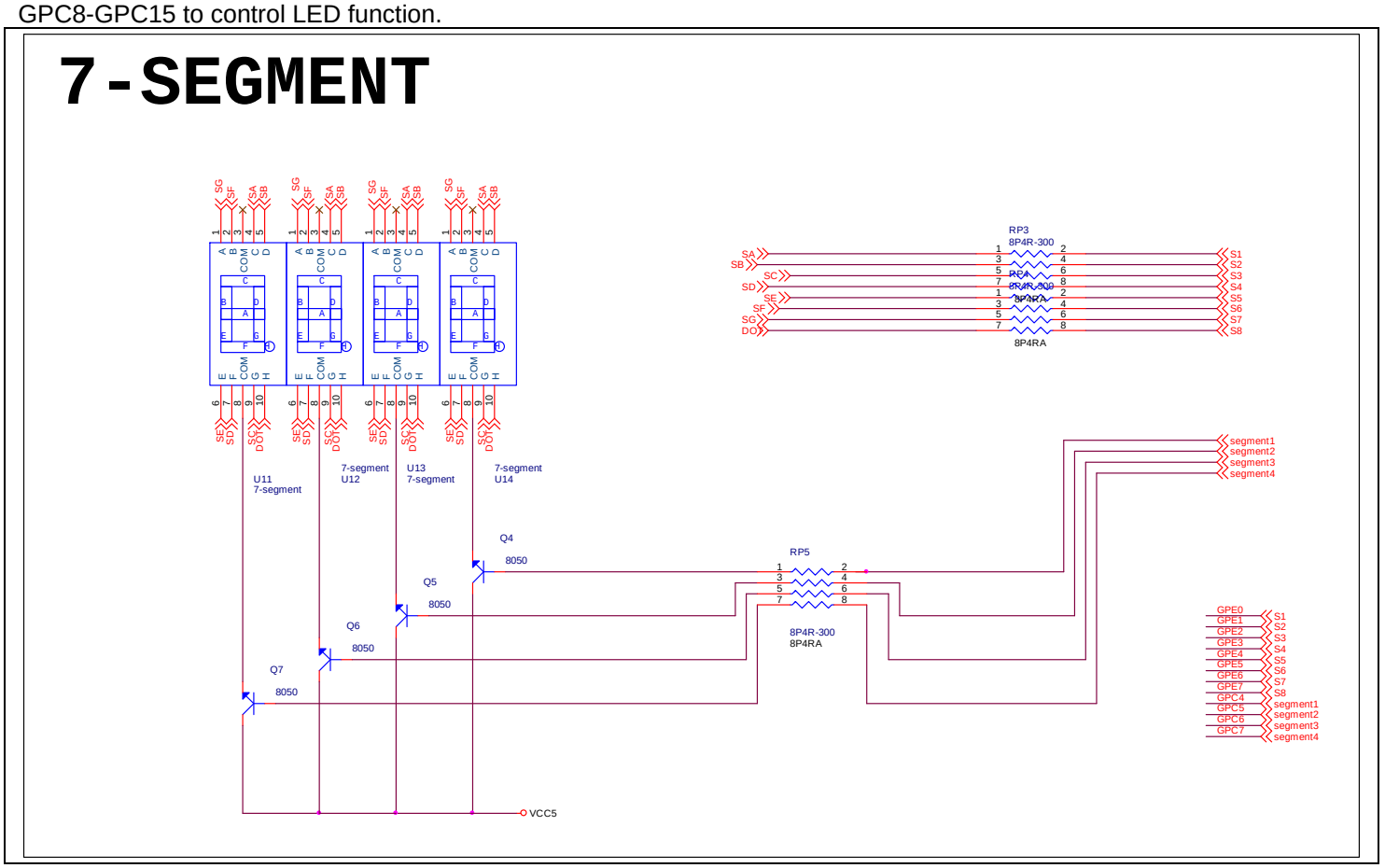
RGB LED

GPA12-GPA13 to control RGB LED function



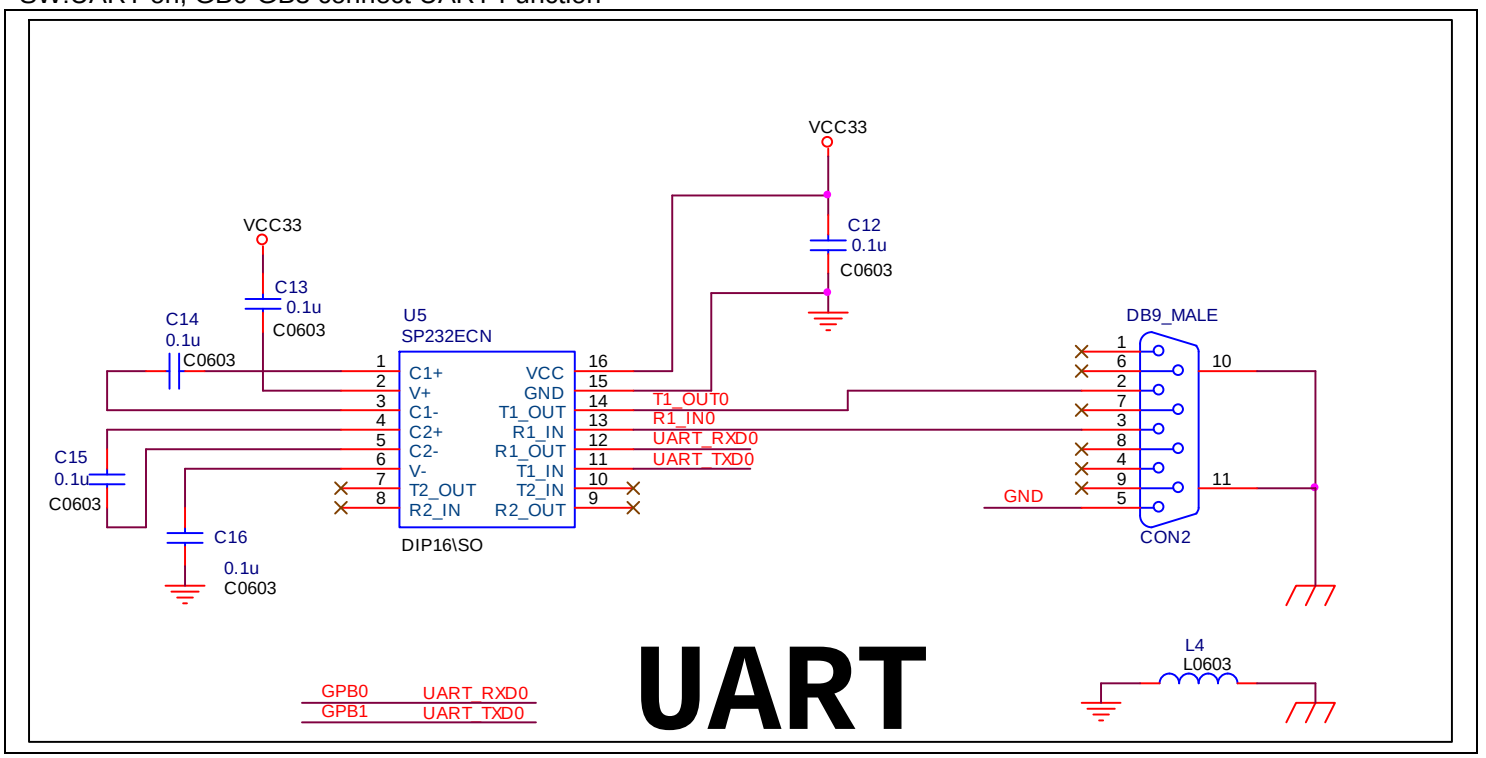
LED

GPC8-GPC15 to control LED function.



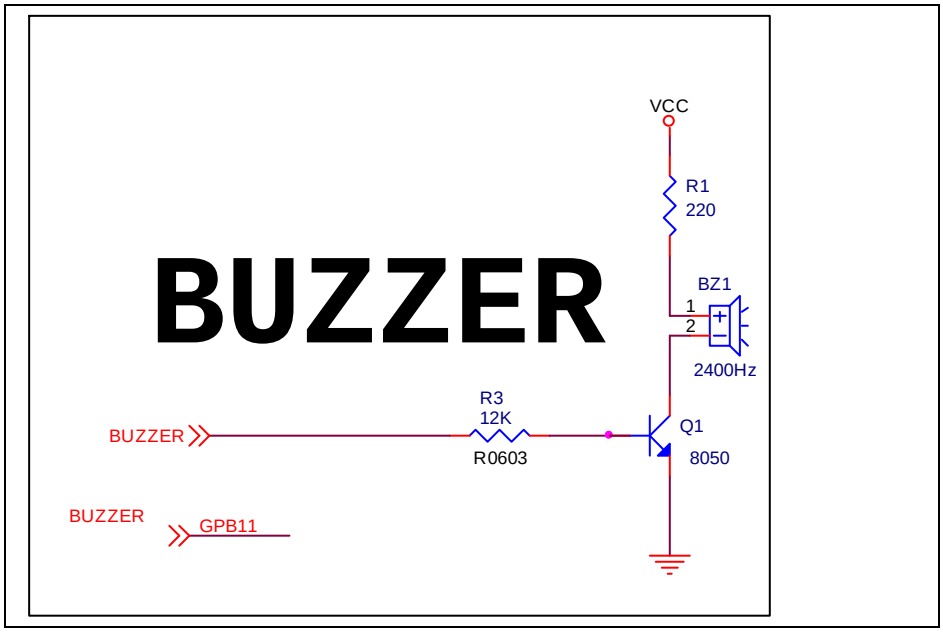
UART

SW:UART on, GB0-GB3 connect UART Function



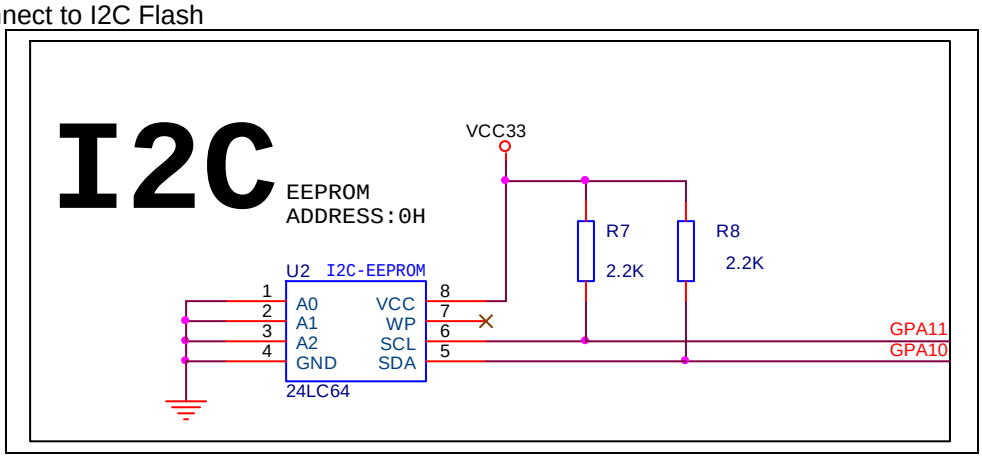
Buzzer

GPB11 connect Buzzer.



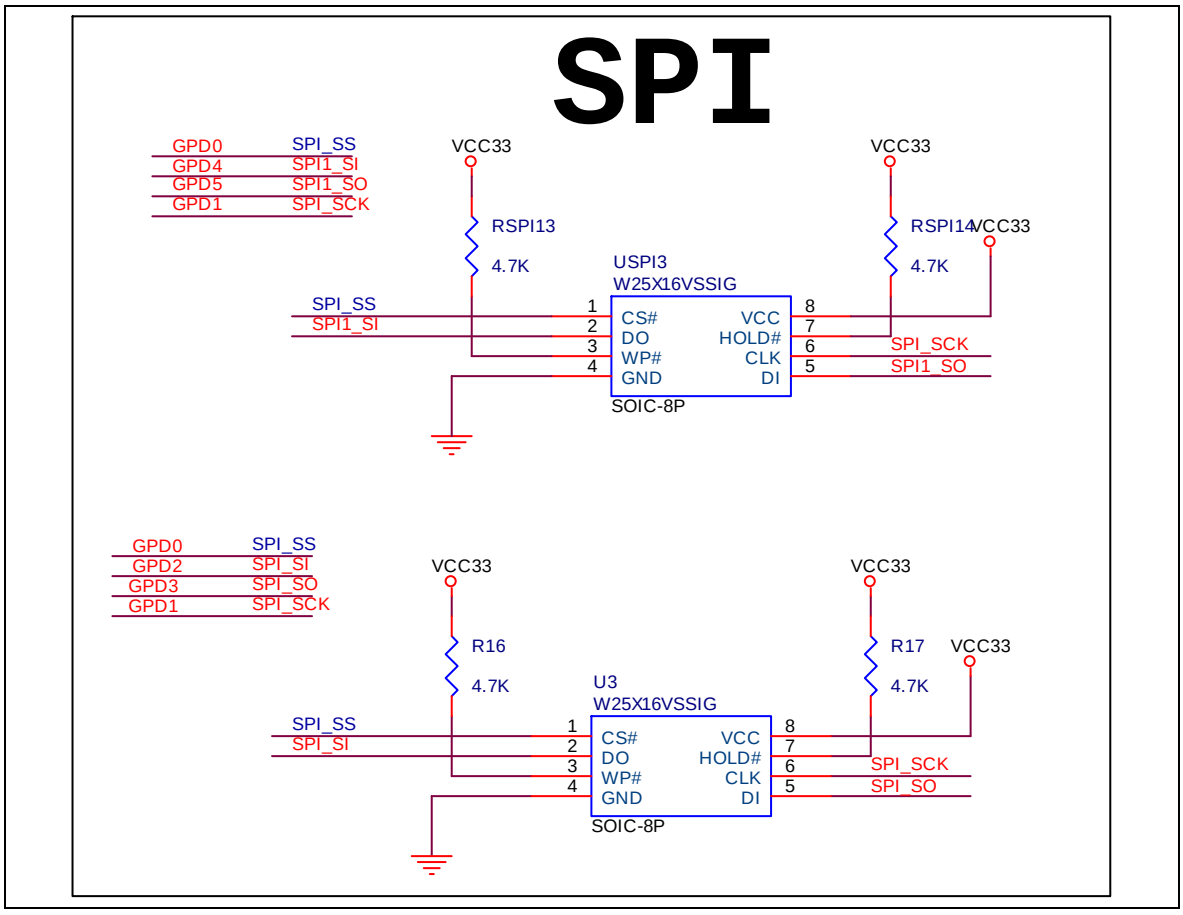
I2C

GPA10-GPA11 connect to I2C Flash



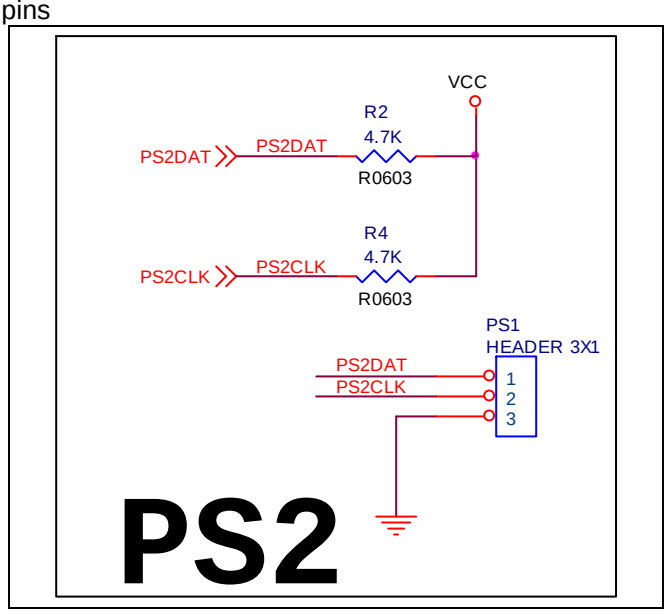
SPI

GPD0-GPD5 connect to SPI Flash



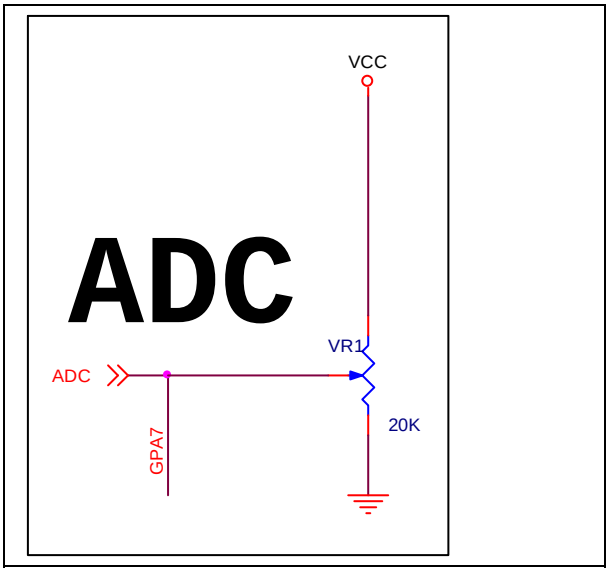
PS2

PS2 connect PS2CLK, PS2DAT pins

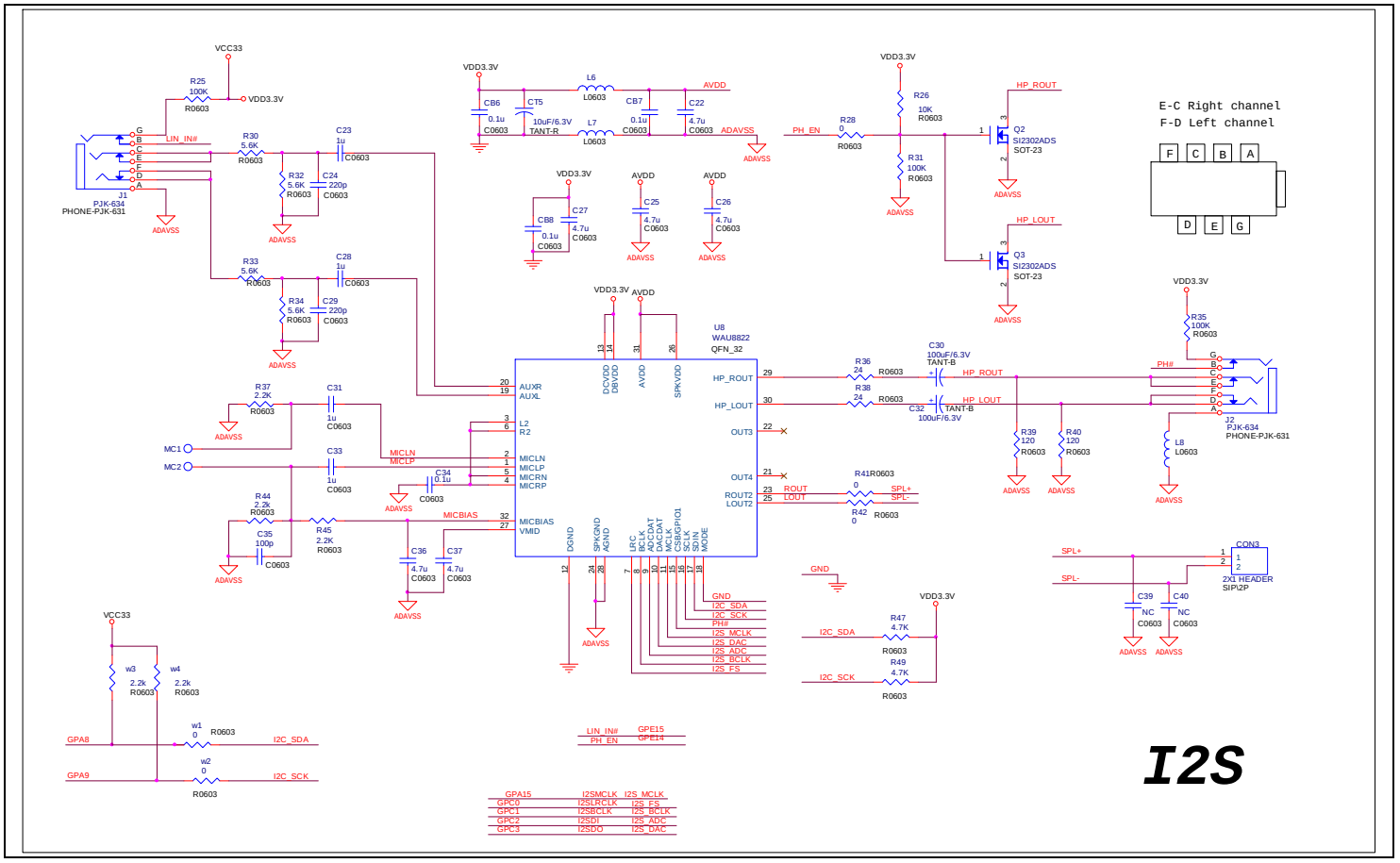


ADC

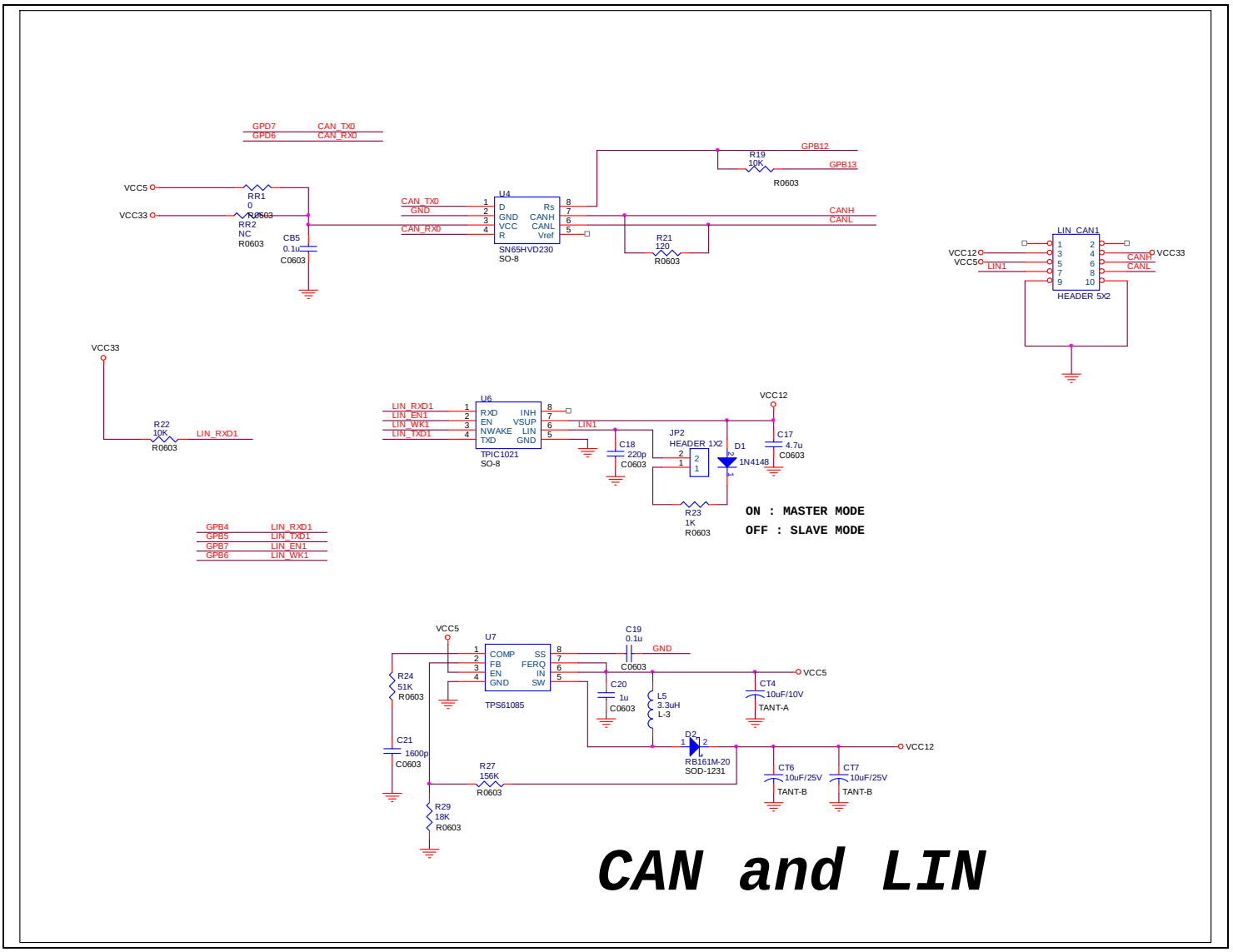
ADC connect GPA7



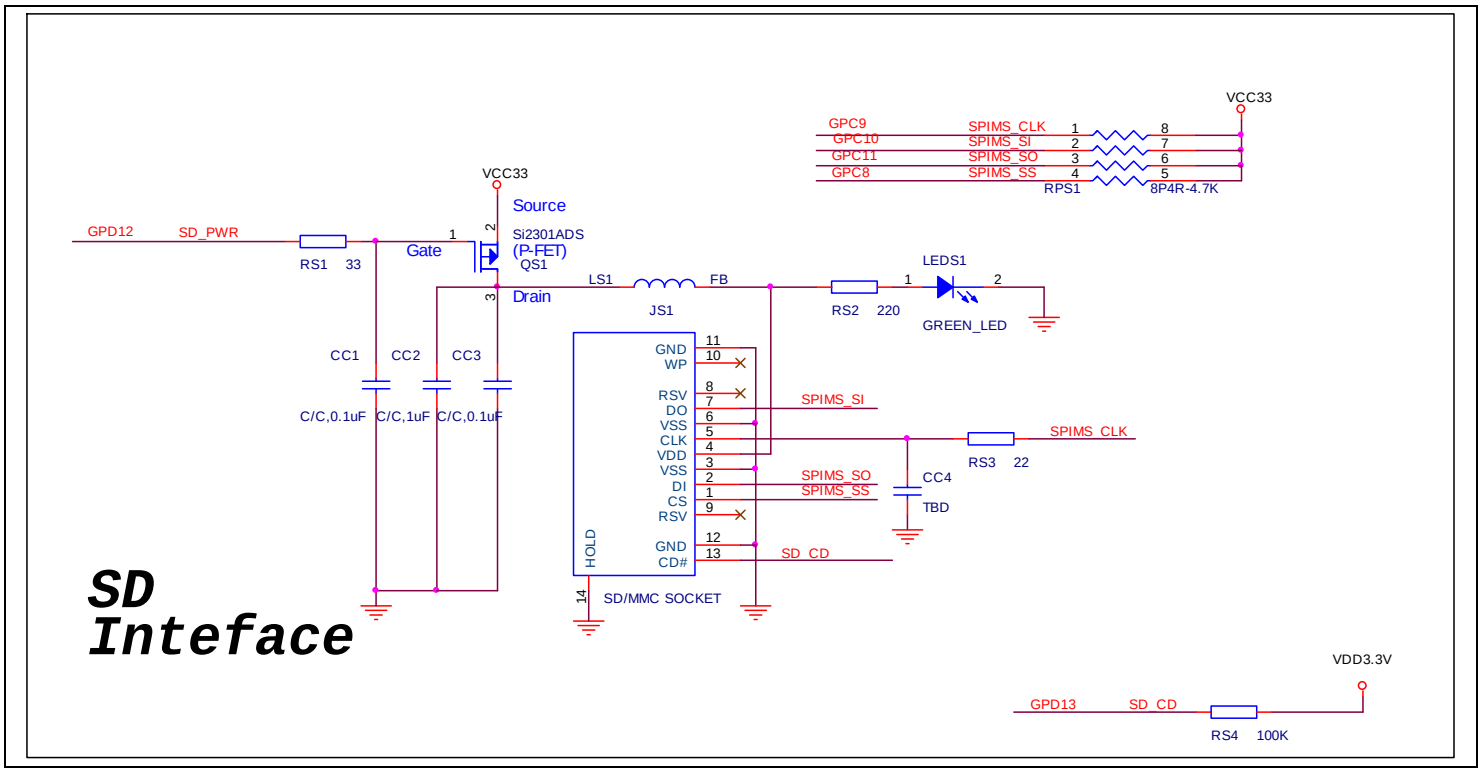
I2S



LIN and CAN



SD Card Interface



11. GPIO Output

GPIO A

JP4

GPA	Define		
1	GPIOA0	ADC0	
2	GPIOA1	ADC1	
3	GPIOA2	ADC2	
4	GPIOA3	ADC3	
5	GPIOA4	ADC4	
6	GPIOA5	ADC5	
7	GPIOA6	ADC6	
8	GPIOA7	ADC7	SPI_SS21
9	GPIOA8	I2C0SDA	
10	GPIOA9	I2C0SCL	
11	GPIOA10	I2C1SDA	
12	GPIOA11	I2C1SCL	
13	GPIOA12	PWM0	
14	GPIOA13	PWM1	
15	GPIOA14	PWM2	
16	GPIOA15	PWM3	
17-18	GND		

GPIO B

JP5

GPAB	DEFINE		
1	GPIOB0	RX0	
2	GPIOB1	TX0	
3	GPIOB2	RTS0	
4	GPIOB3	CTS0	
5	GPIOB4	RX1	
6	GPIOB5	Tx1	
7	GPIOB6	RTS1	
8	GPIOB7	CTS1	
9	GPIOB8	TM0	STADC
10	GPIOB9	TM1	SPI_SS11
11	GPIOB10	TM2	SPI_SS01
12	GPIOB11	TM3	
13	GPIOB12	CPO0	
14	GPIOB13	CPO1	
15	GPIOB14	INT0	SPI_SS31
16	GPIOB15	INT1	
17-18	GND		

GPIO C

GP6

GPCD	DEFINE	
1	GPIOC0	SPI_SS00
2	GPIOC1	SPICLK0
3	GPIOC2	SDI00
4	GPIOC3	SDO00
5	GPIOC4	SDI01
6	GPIOC5	SDO01
7	GPIOC6	CPP0
8	GPIOC7	CPN0
9	GPIOC8	SPI_SS10
10	GPIOC9	SPICLK1
11	GPIOC10	SDI10
12	GPIOC11	SDO10
13	GPIOC12	SDI11
14	GPIOC13	SDO11
15	GPIOC14	CPP1
16	GPIOC15	CPN1
17-18	GND	

GPIO D

JP7

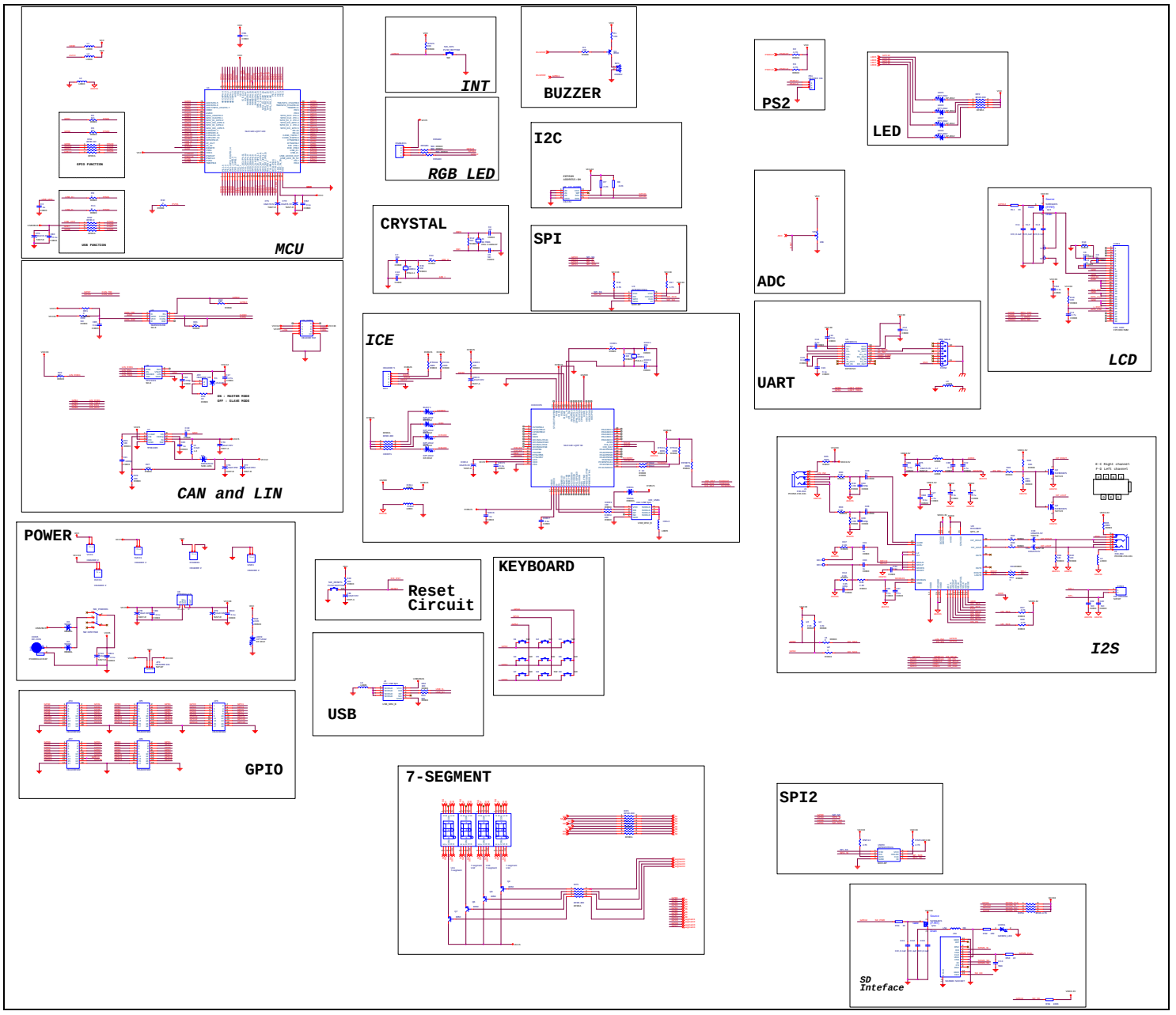
GPCD	DEFINE	
1	GPIOD0	SPI_SS20
2	GPIOD1	SPICLK2
3	GPIOD2	SDI20
4	GPIOD3	SDO20
5	GPIOD4	SDI21
6	GPIOD5	SDO21
7	GPIOD6	CAN0_RX
8	GPIOD7	CAN0_TX
9	GPIOD8	SPI_SS30
10	GPIOD9	SPICLK3
11	GPIOD10	SDI30
12	GPIOD11	SDO30
13	GPIOD12	SDI31
14	GPIOD13	SDO31
15	GPIOD14	CAN1_RX
16	GPIOD15	CAN1_TX
17-18	GND	

GPIO E

JP8

GPE	DEFINE
1	GPIOE0
2	GPIOE1
3	GPIOE2
4	GPIOE3
5	GPIOE4
6	GPIOE5
7	GPIOE6
8	GPIOE7
9	GPIOE8
10	GPIOE9
11	GPIOE10
12	GPIOE11
13	GPIOE12
14	GPIOE13
15	GPIOE14
16	GPIOE15
17-18	GND

12. Schematic



13. Revision history

version	date	page	description
1.0	May 17, 2010	--	Initial Issued