

# TS-7400\_V2

## TS-7400\_V2 BOM

CN9 and FB19 not pop

R31 and 32 Not pop

Full Size SD card socket is optional

CAN and RS-232 transceivers are optional

5V Reg. is optional

MX283 CPU OK for non-CAN versions

D1 populated ?

## Open Issues for Rev.A

Fix USB\_OTG stubs

RAM standby ever to be used ?

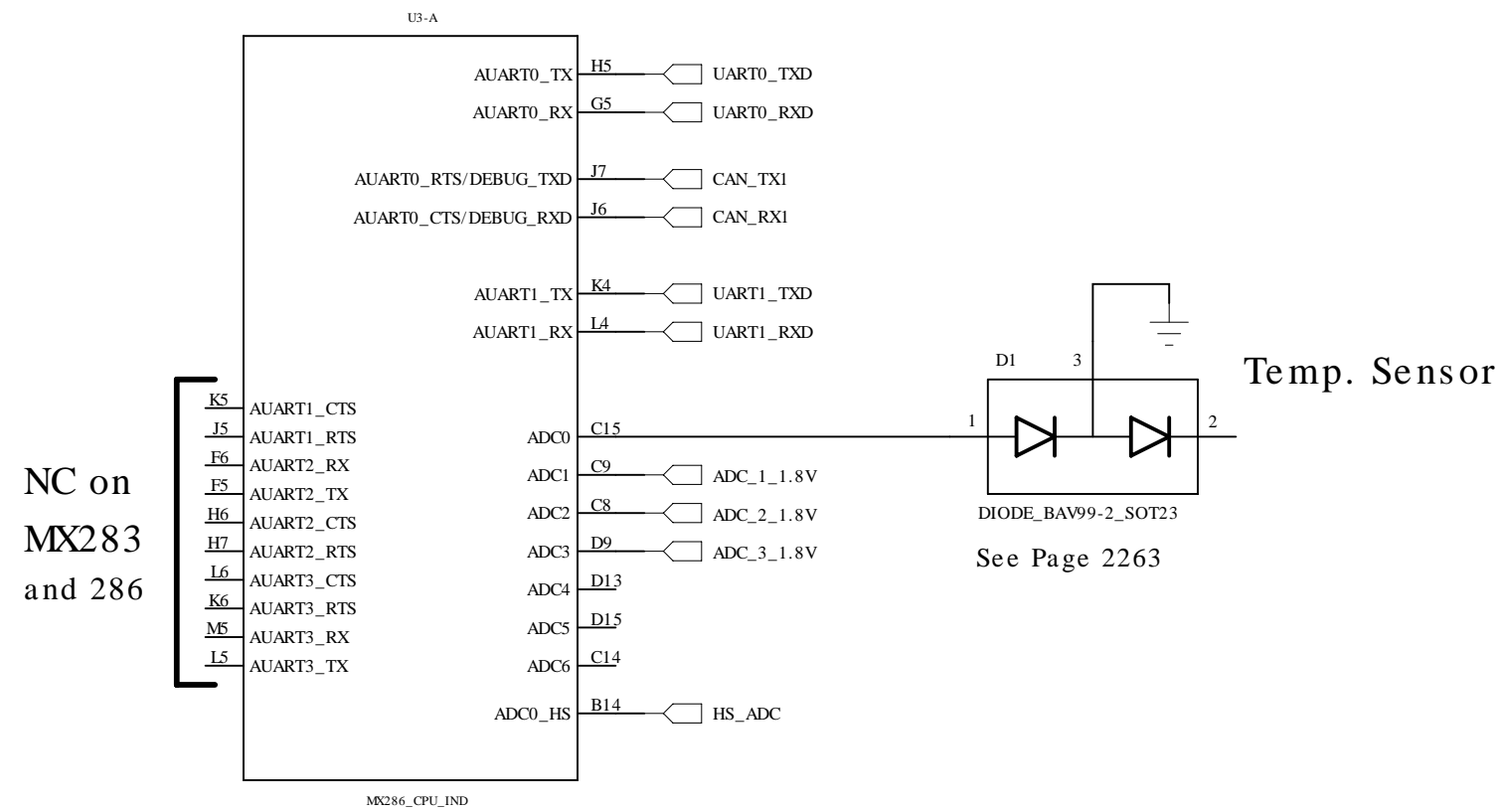
Separate 0.9V Vref ?

PWM outputs can be 24 MHz  
divided by 16-bit integer  
Allows clock 12MHz and lower

Technologic Systems	Date	Dec. 31, 2013
Title: TS-7400_V2 MX286 CPU		
Rev: A	Designer	Sheet 1 of 11

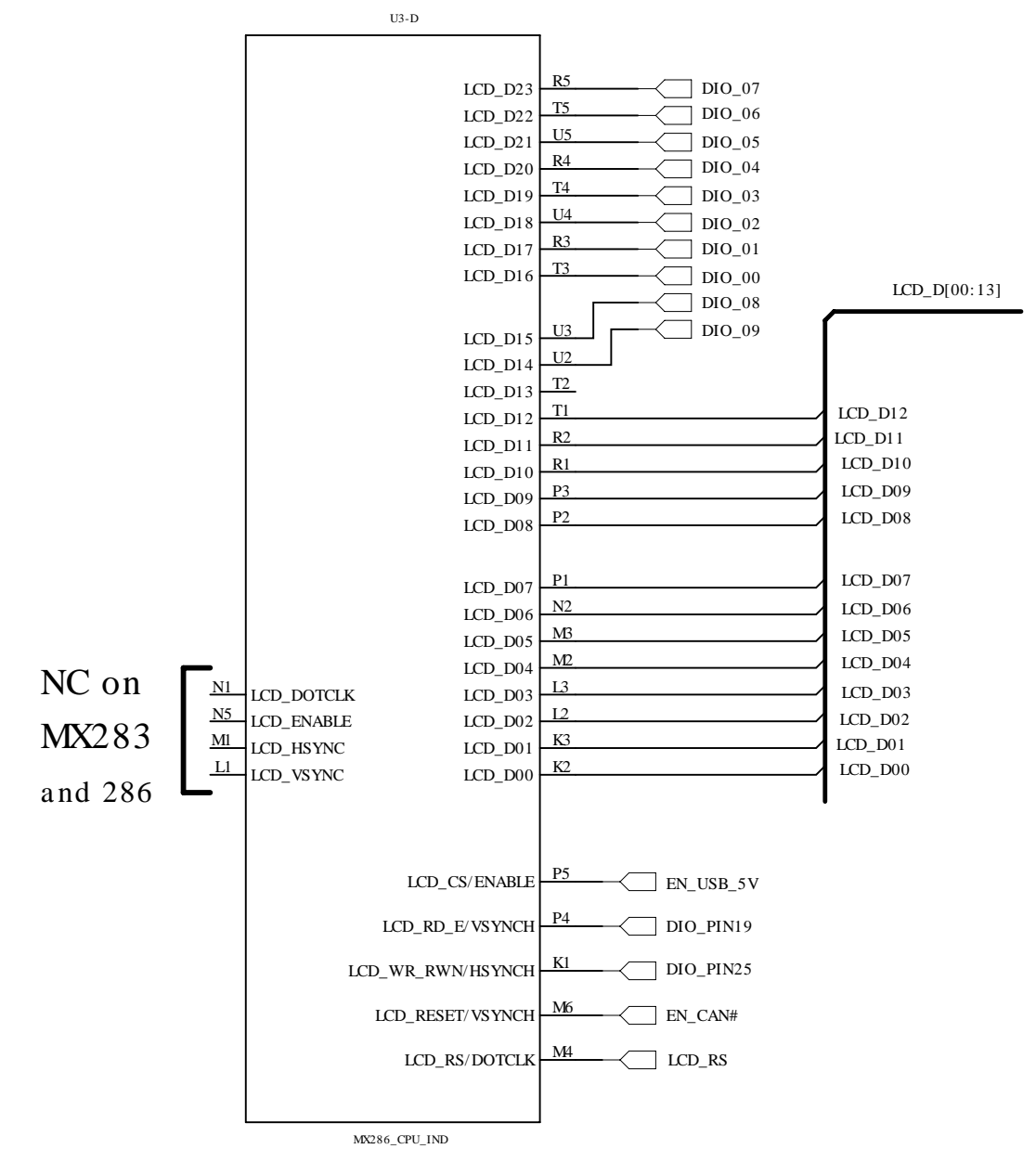
# MX286 ARM9 CPU

## UARTs, ADC



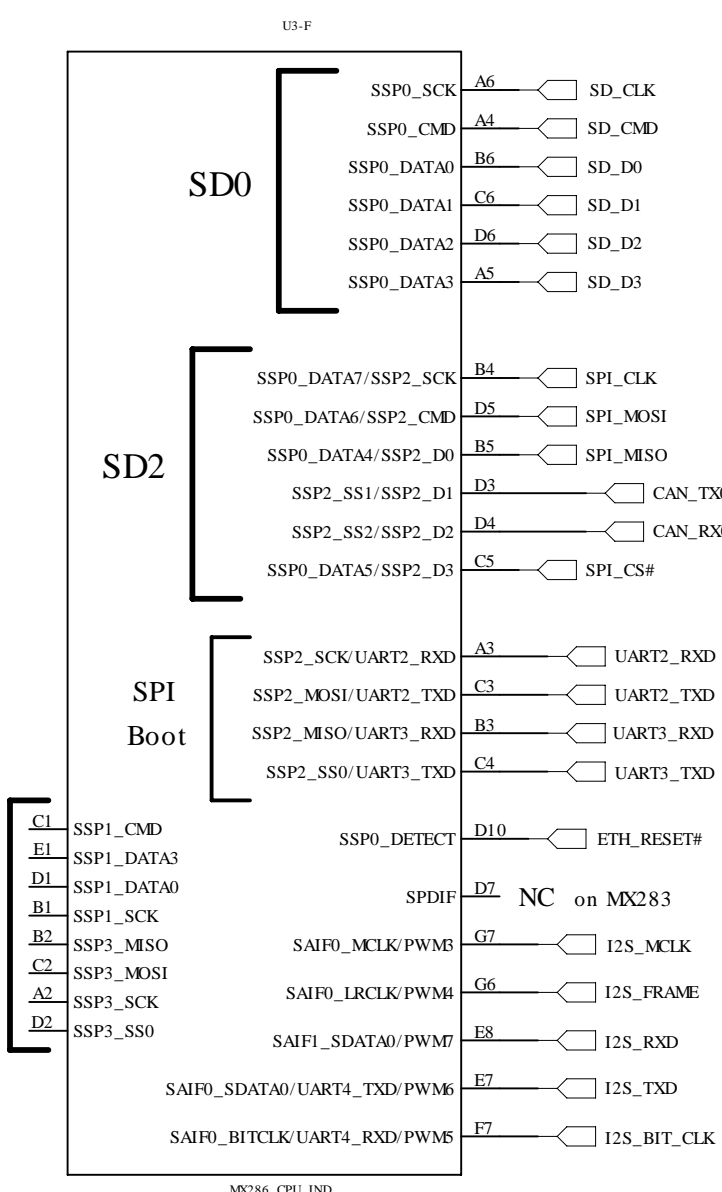
NC on  
MX283  
and 286

## LCD



## NAND, PWM JTAG, I2C

## Audio SD Card SPI Boot

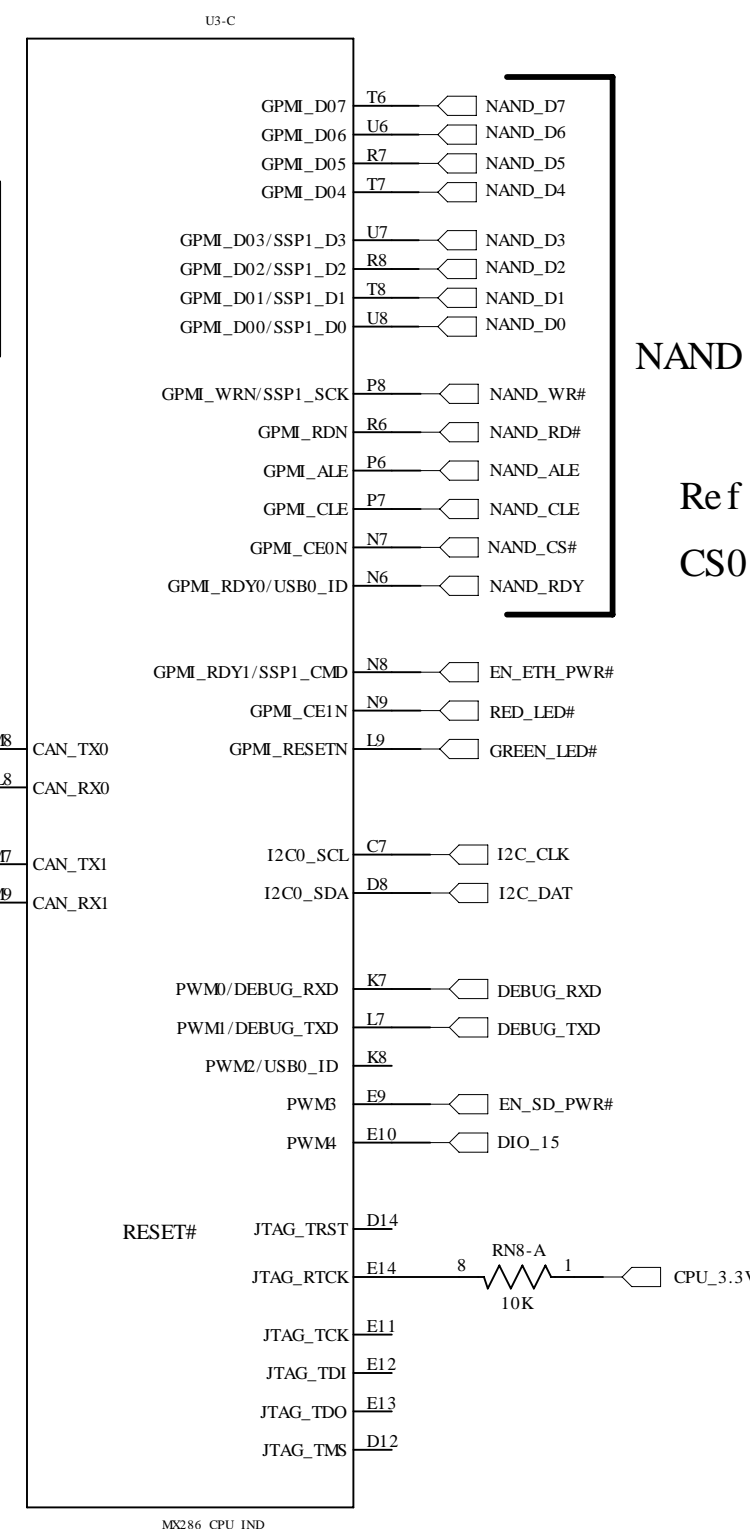


SPI  
SCK = CLK  
CMD = MOSI  
D0 = MISO  
D3 = CS#

MX286 adds  
4 CAN signals  
and ball D7

12 MHz default boot clock  
U3.D3 and U3.D4 are extra  
2 data lines for SPI x4 read  
Page 1313 of Data sheet

Page 1311 - Winbond SPI x2 and x4 supported  
EVK schematic references a 8Mbit Winbond chip



NAND Interface

Ref Design uses  
CS0 and RDY0

LCD\_00 thru LCD\_04  
Control Boot Source

LCD\_05 and 06 bias low  
LCD\_RS biased high  
LCD\_RS low = use OTP  
See: EVK schematic, Page 15

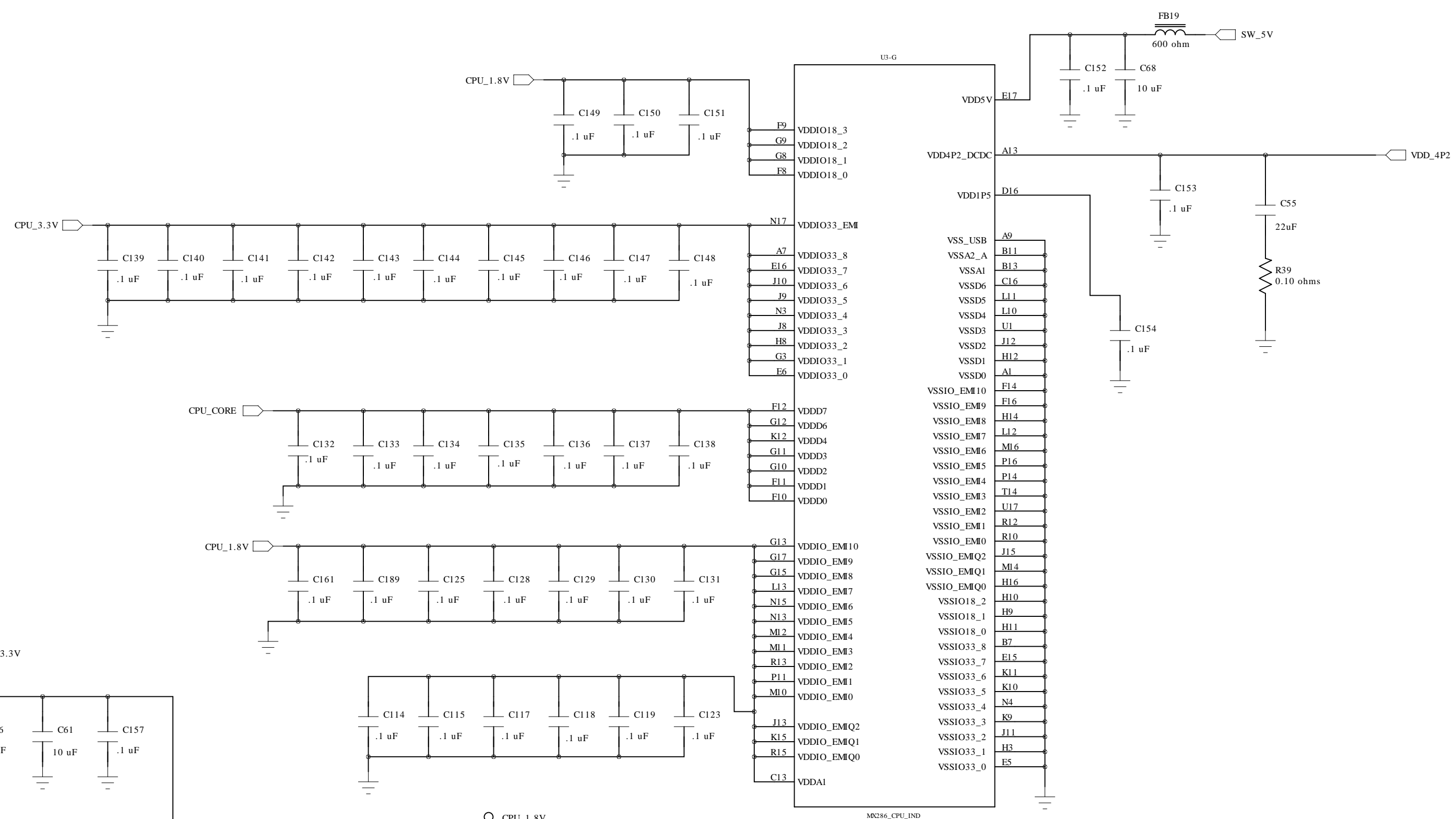
F3 is EVK ETH\_RESET#  
F5, F6 are EVK USB\_PWR\_EN  
E1 is EVK Eth\_PWR\_EN  
C7 and D8 = EVK I2C  
J5 is EVK USB\_0\_ID  
K8 is EVK LCD PWM  
K7 and L7 are EVK console

E10 is EVK SD1\_PWR\_EN  
E9 is SD0 PWR\_EN on both  
EVK and Green schematics

PWM outputs can be 24 MHz  
divided by 16-bit integer  
Allows clock 12MHz and lower

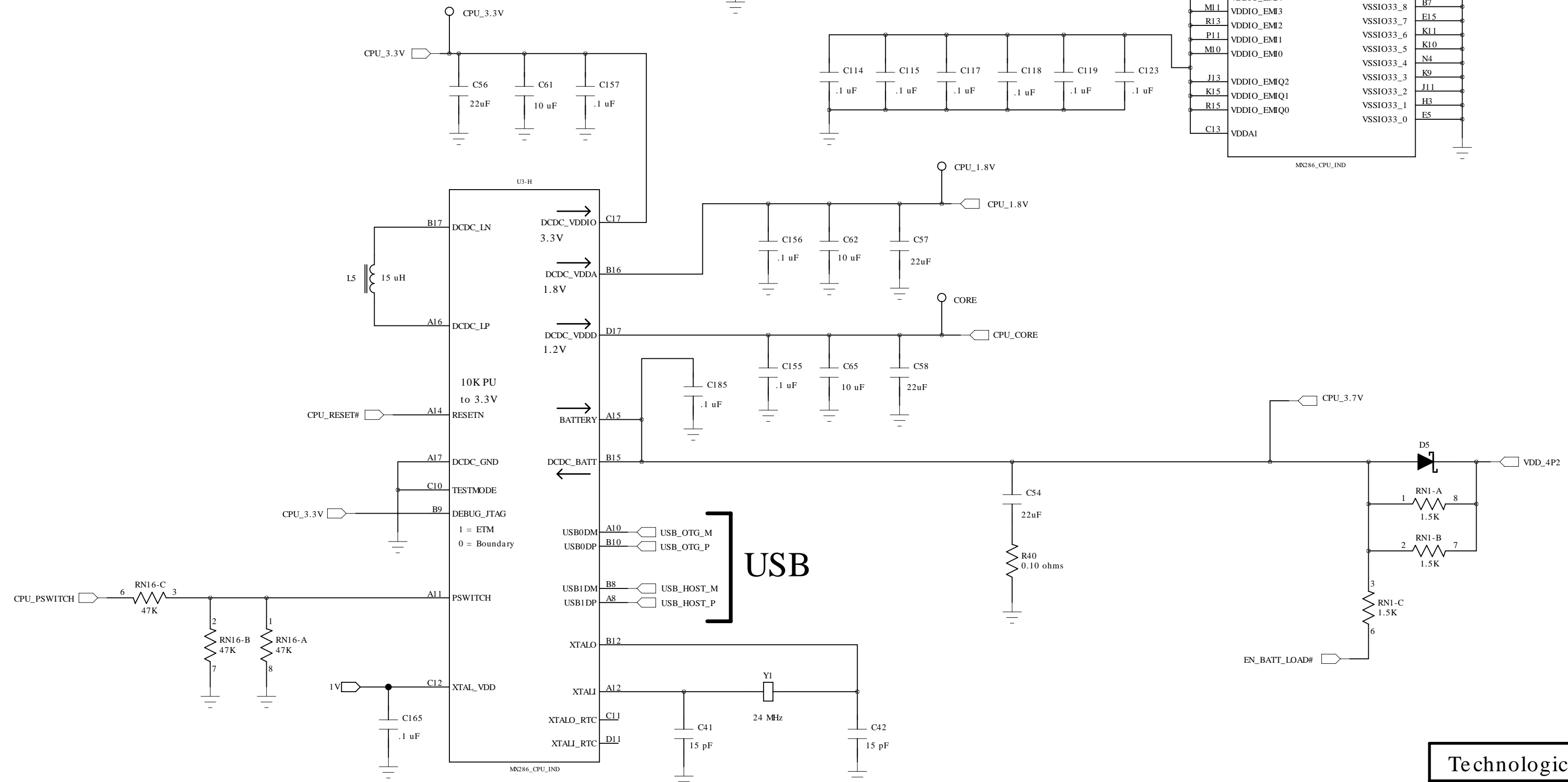
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VDD4P2 is an output -- only feeds two 1.2K resistors  
 Reg VDD1P5 goes to nothing



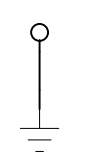
Battery pin supplies current to charge battery

DCDC\_BAT pin is power input for DCDC converters -- connect direct to battery



EVK has FET in parallel with D5 "to improve efficiency"

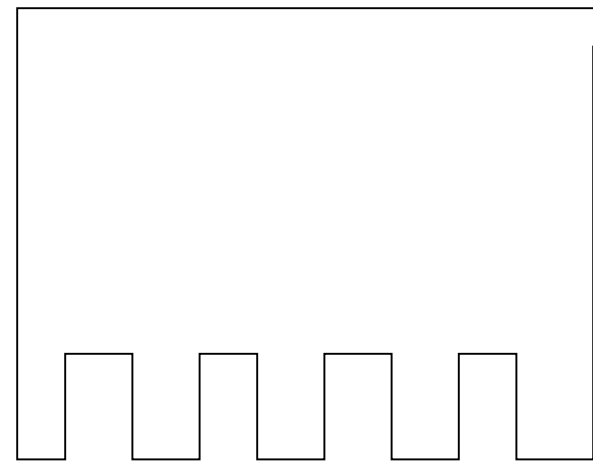
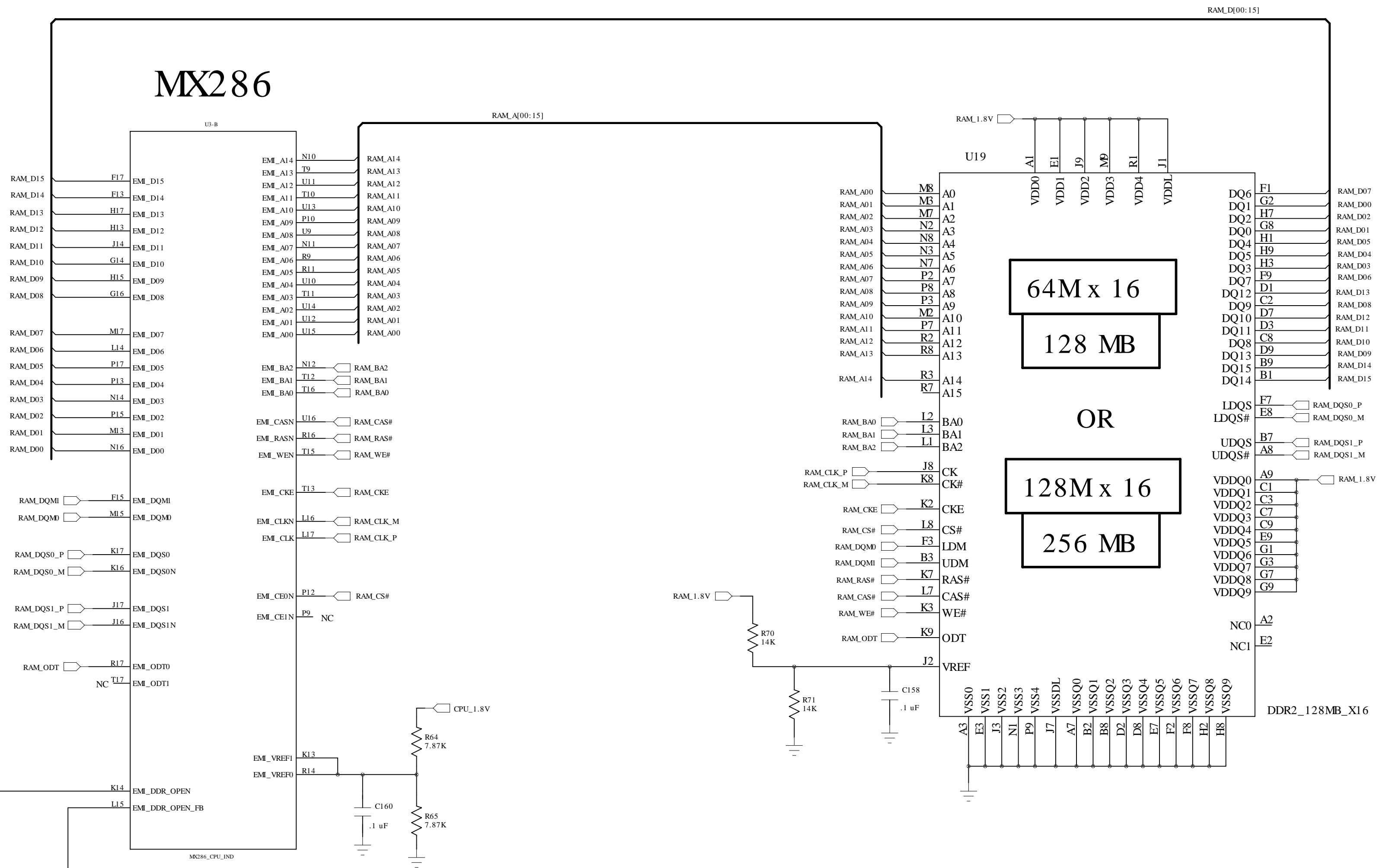
GND Test Point



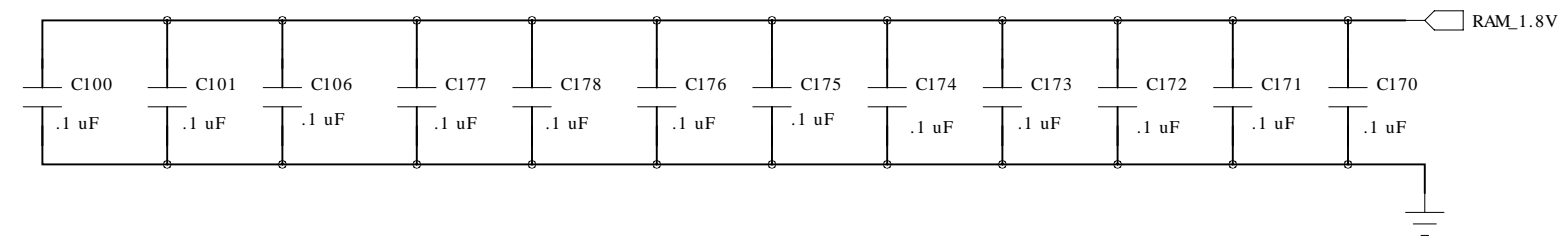
PSWITCH can be driven to 3.3V if a series 10K res is used

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Title: TS-7400_V2 MX286 CPU Power	
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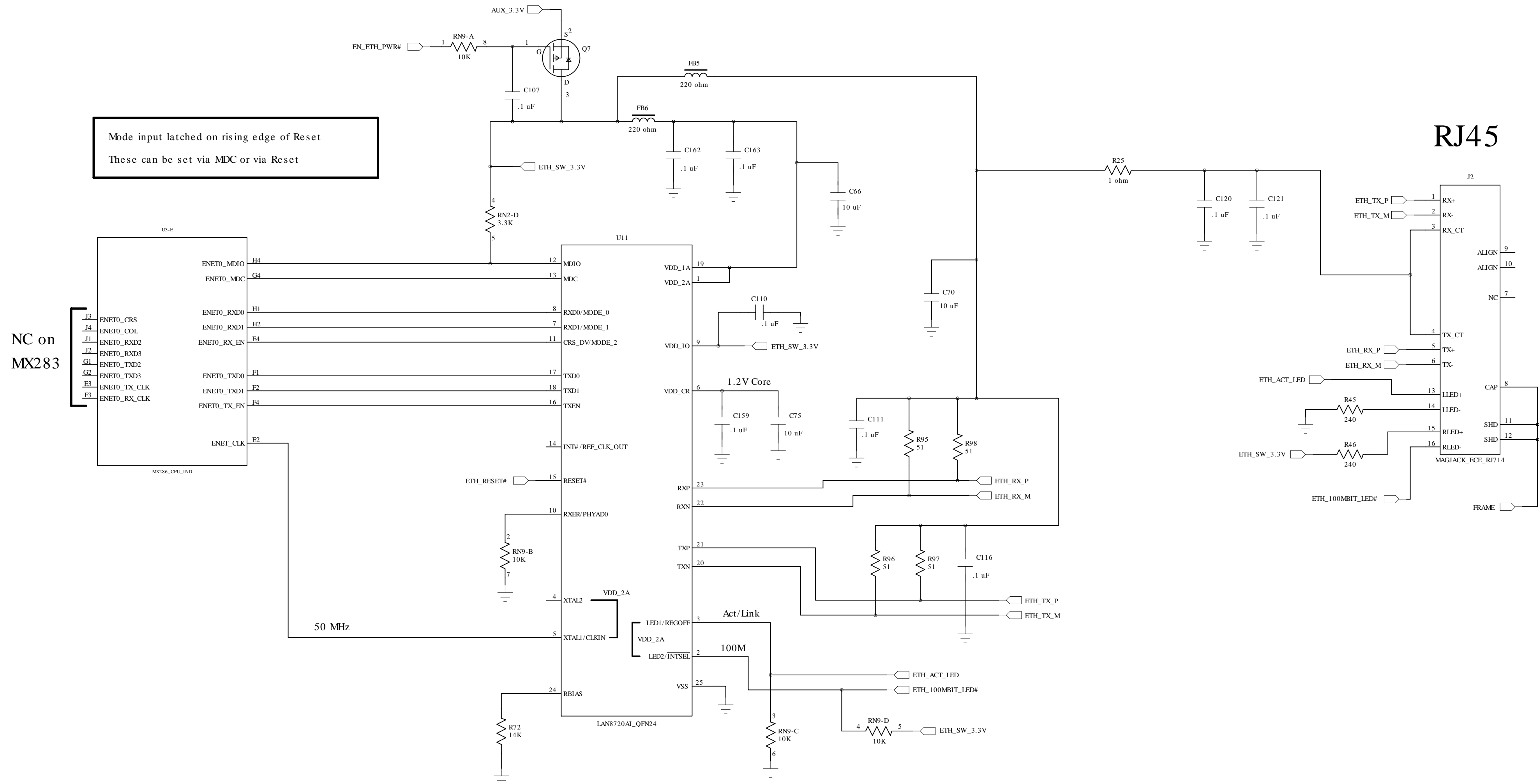
# DDR2 SDRAM (128 or 256 MByte)



Length of this trace is equal to [CLK + Data] lengths  
Data = Average length of all data traces



# 10/100 Ethernet



Mode input latched on rising edge of Reset  
These can be set via MDC or via Reset

NC on  
MX283

PHY address and modes latched  
on rising edge of Reset#

LED high voltage  
is VDD\_2A = 3.3V

LED active state is always  
the opposite as the strap state

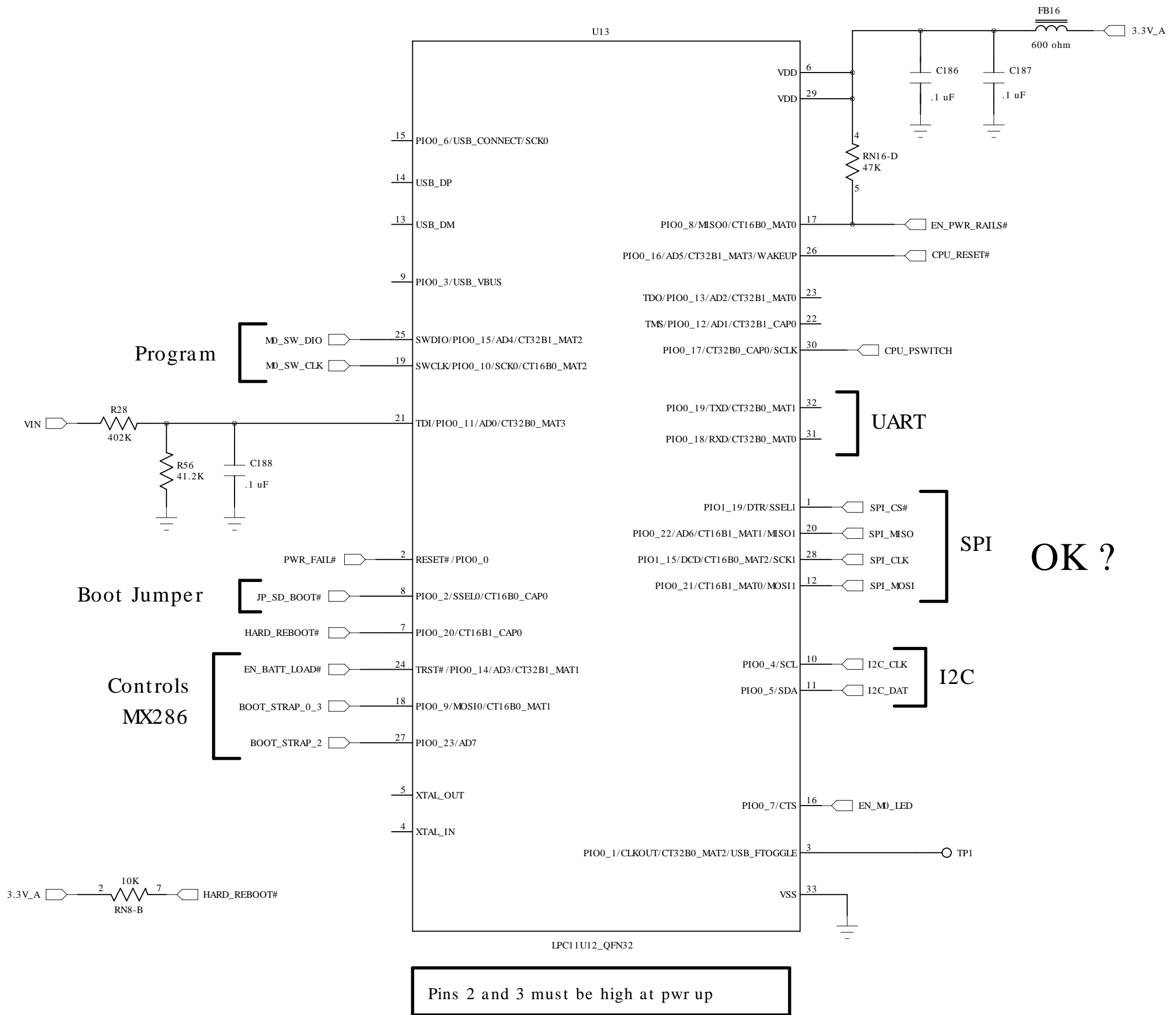
MDIO bus can not be  
used until 100 uS after  
Reset# is deasserted  
MDCLK max is 2.5 MHz

Auto MDIX is supported and  
Polarity Correction supported

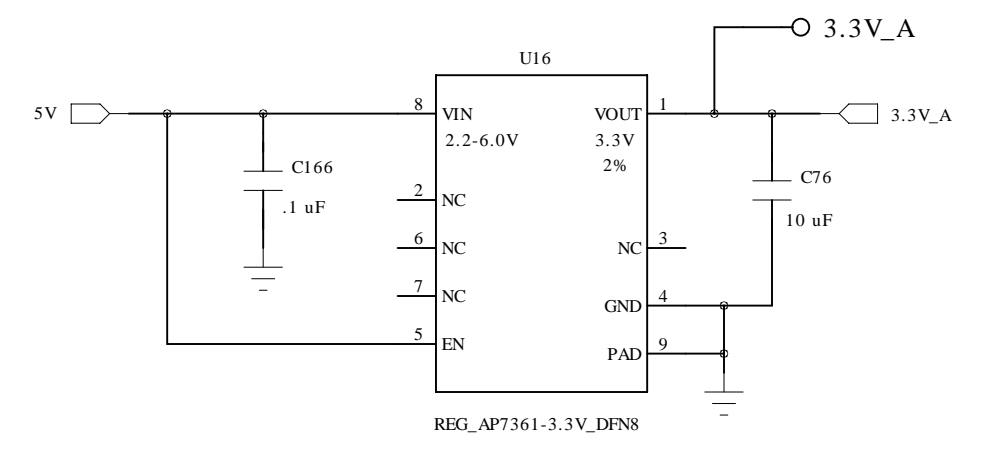
Technologic Systems		Date Dec. 31, 2013
Title: TS-7400_V2 Ethernet Port		
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# Cortex M0

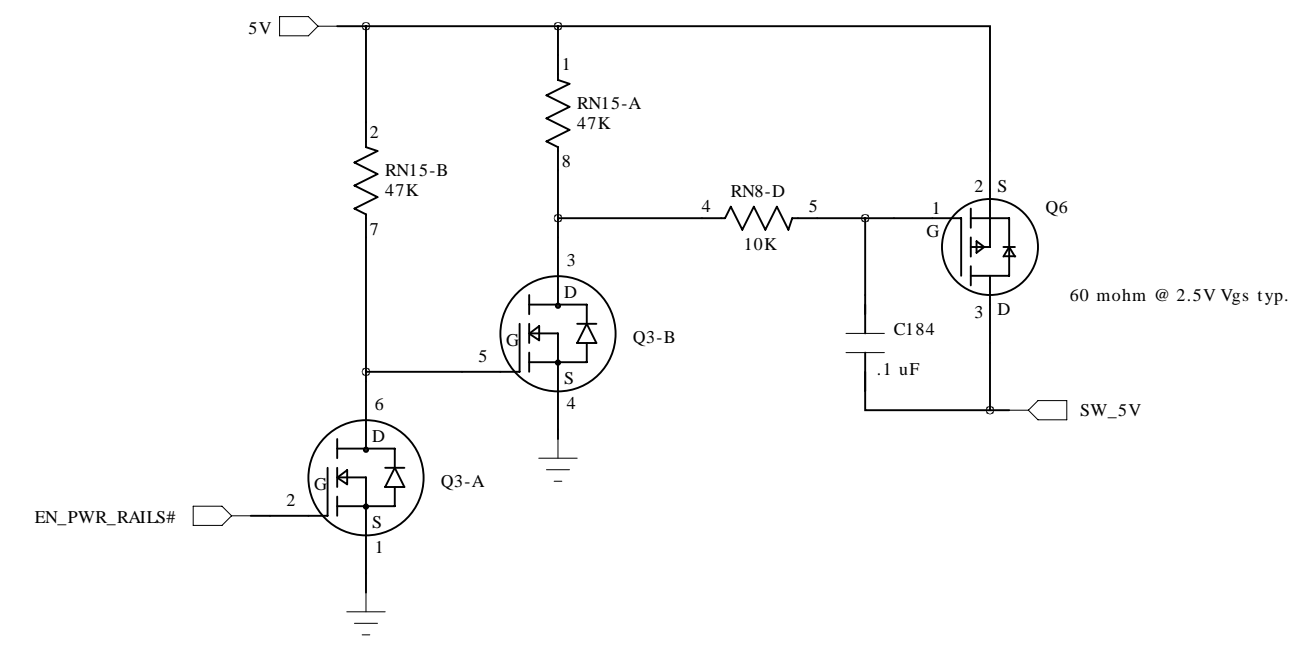
## Cortex M0



## 3.3V Reg. for M0

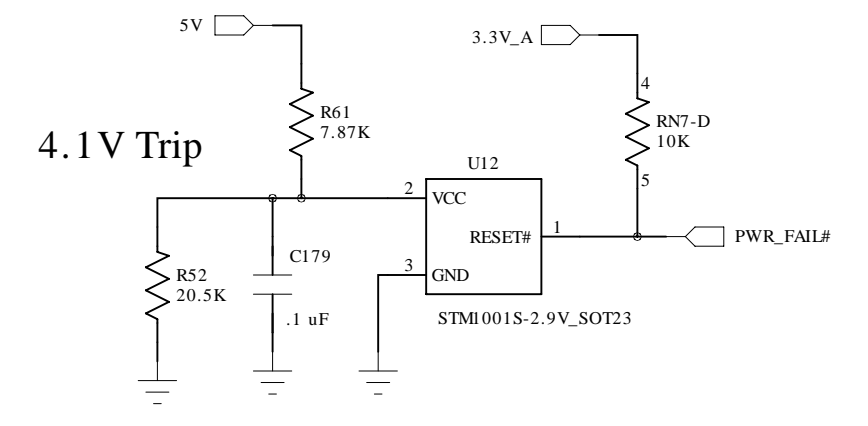


## Switched 5V

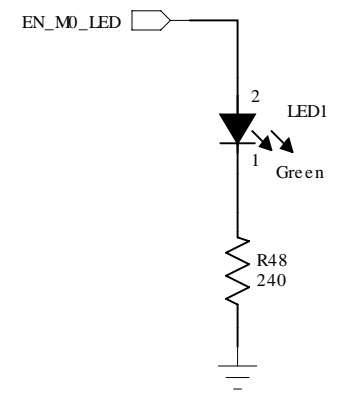


OK ?

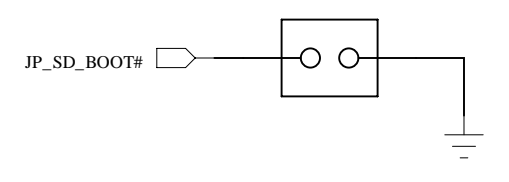
## Brown out Detect



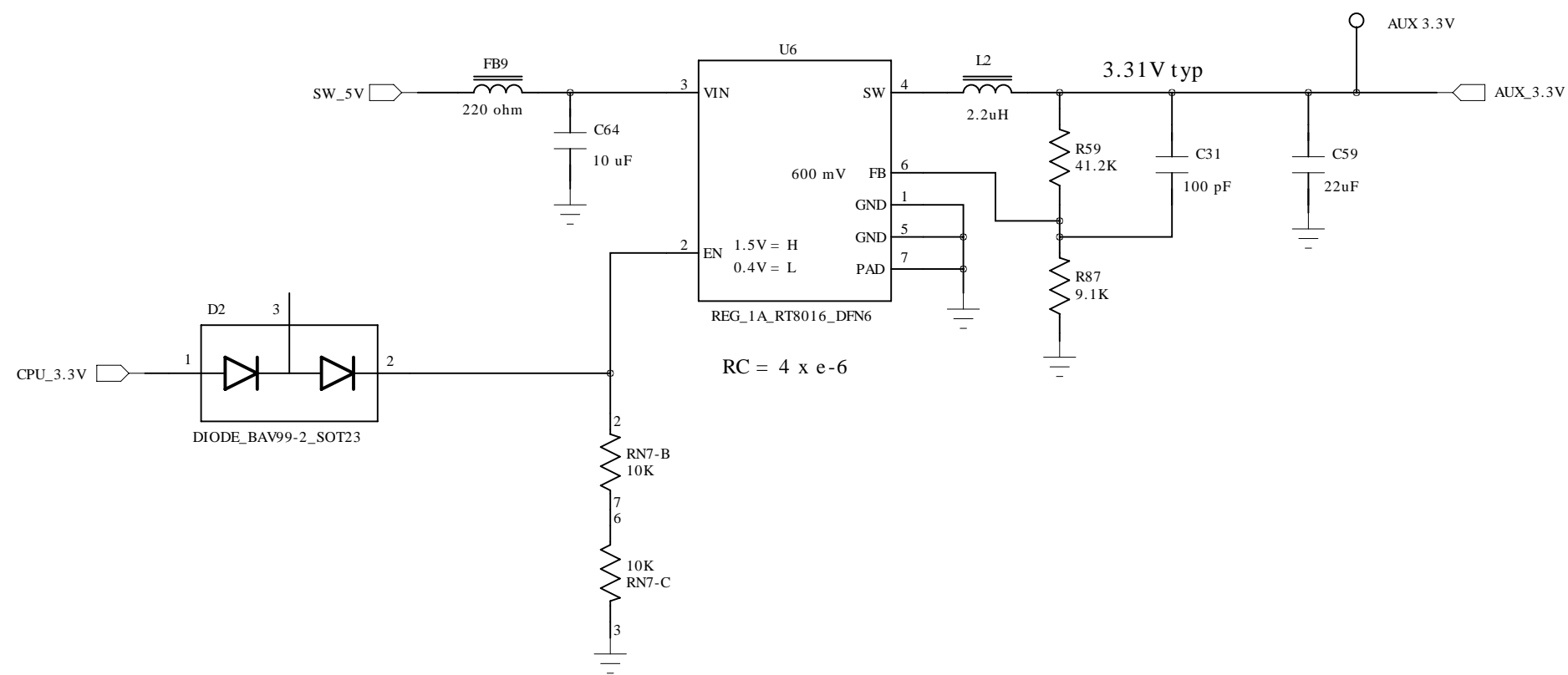
## M0 LED



## SD Jumper



# Aux. 3.3V Reg



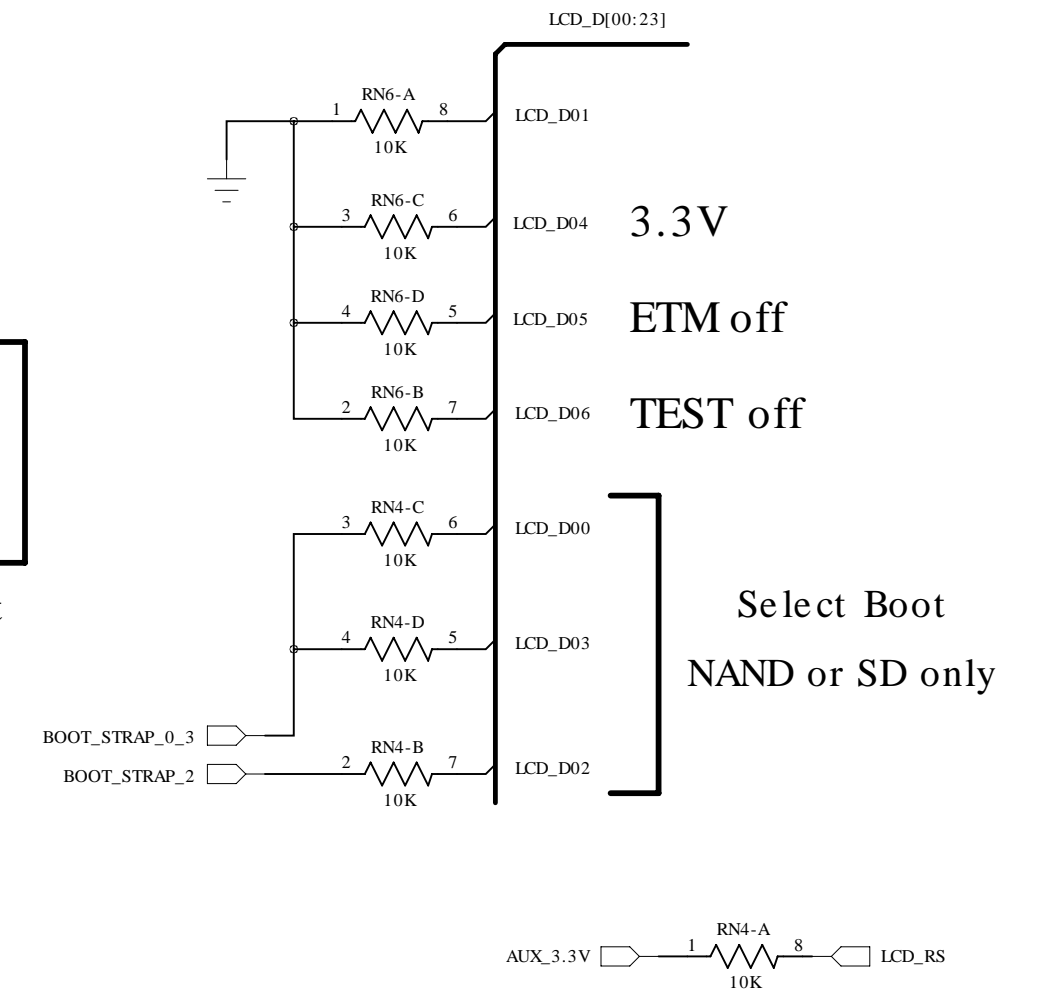
# Boot Strap Bias Res.

Defaults to NAND

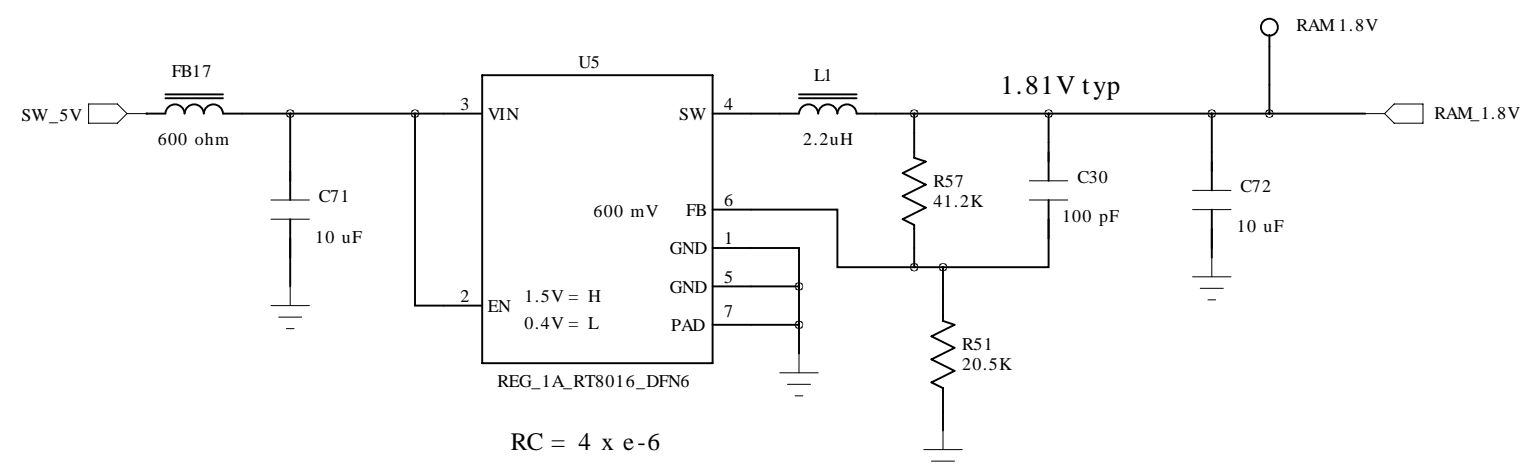
Boot Source

LCD_3	LCD_0	Boot Source
0 0 1 0		SPI
1 0 0 1		SD Card
0 0 0 0		USB
0 1 0 0		NAND

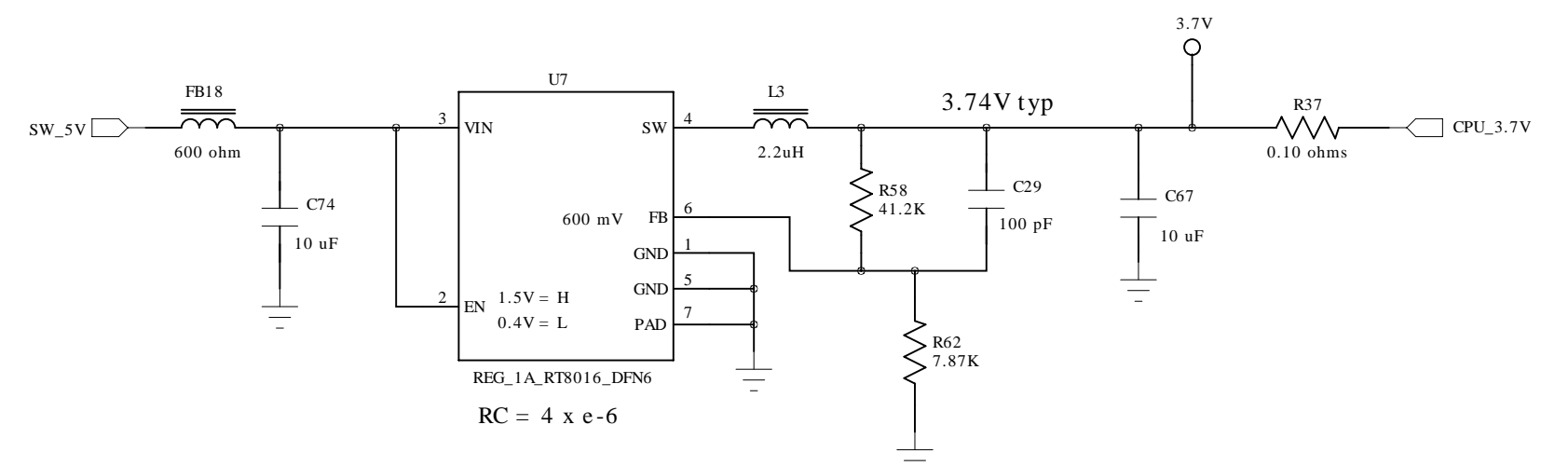
Jumper forces SD Boot



# RAM 1.8V Reg



# CPU BATT 3.7V



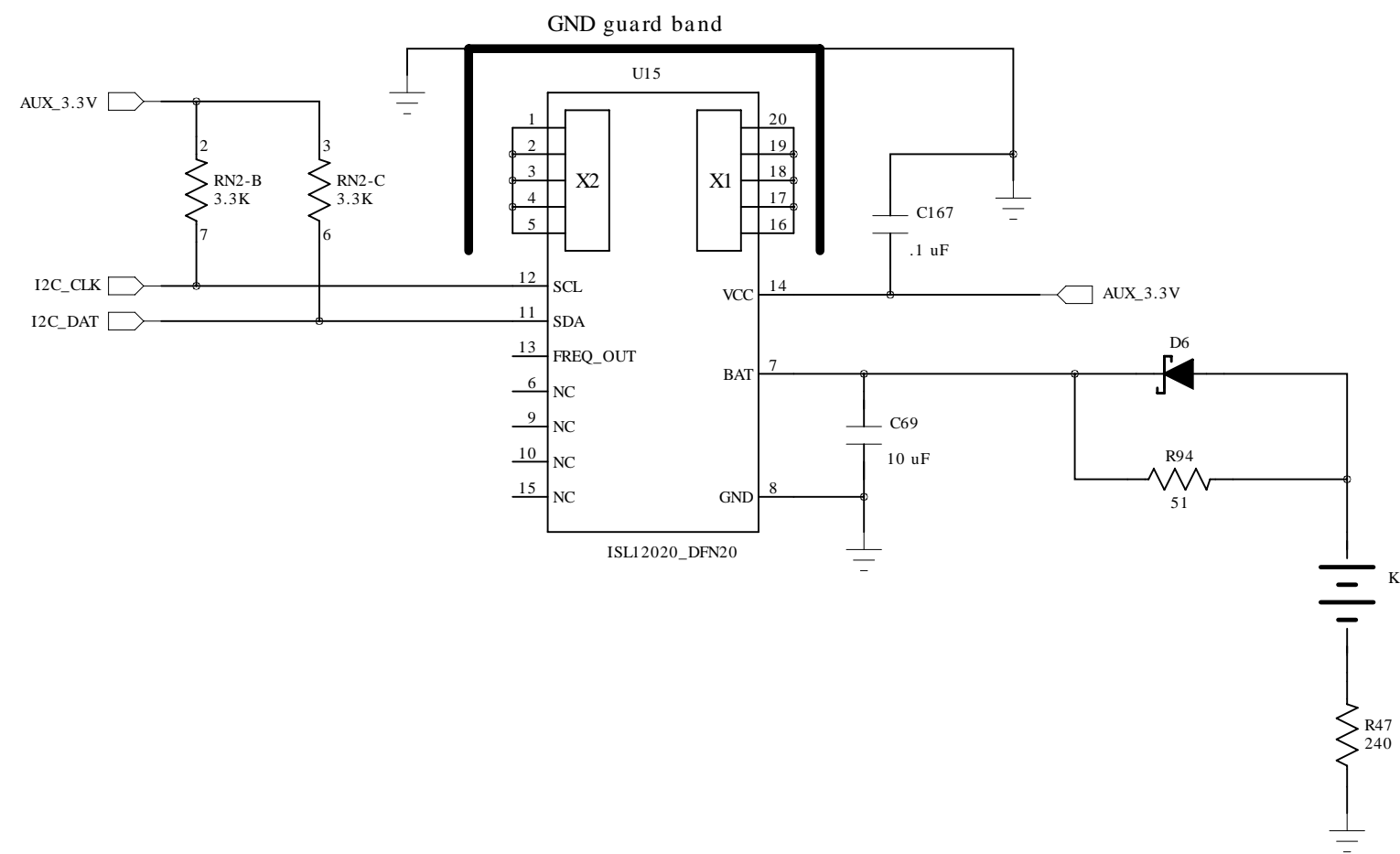
This Reg only required for extra low power mode

FB19 not installed when this reg. is used

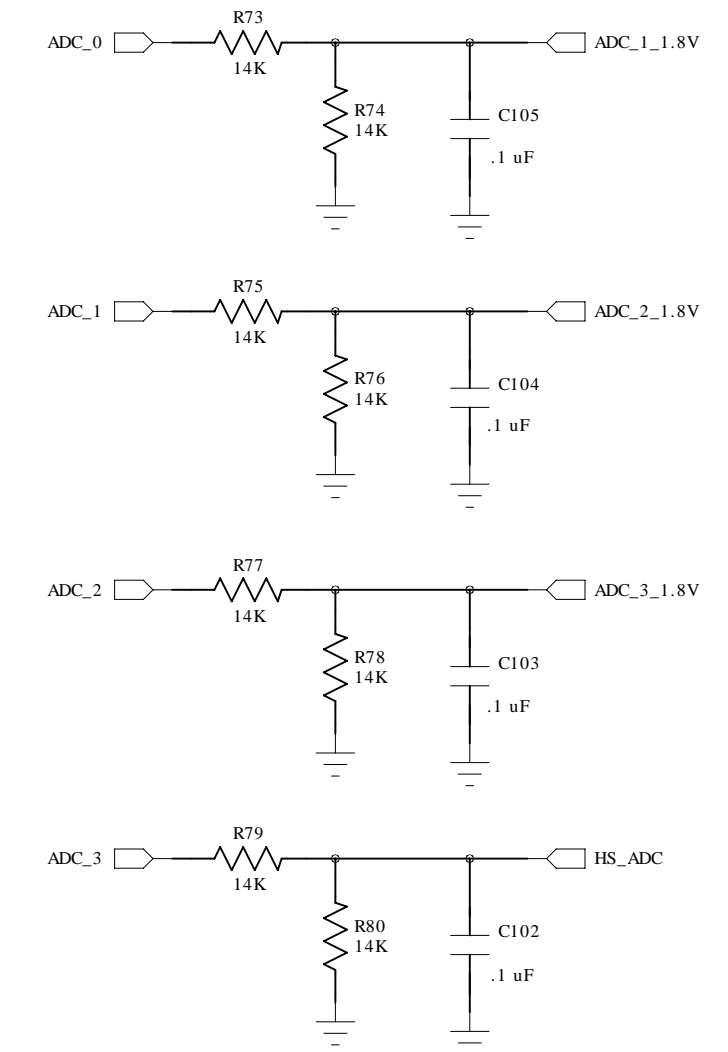
Requires a positive pulse on PSWITCH

# RTC, RS-232 and Analog

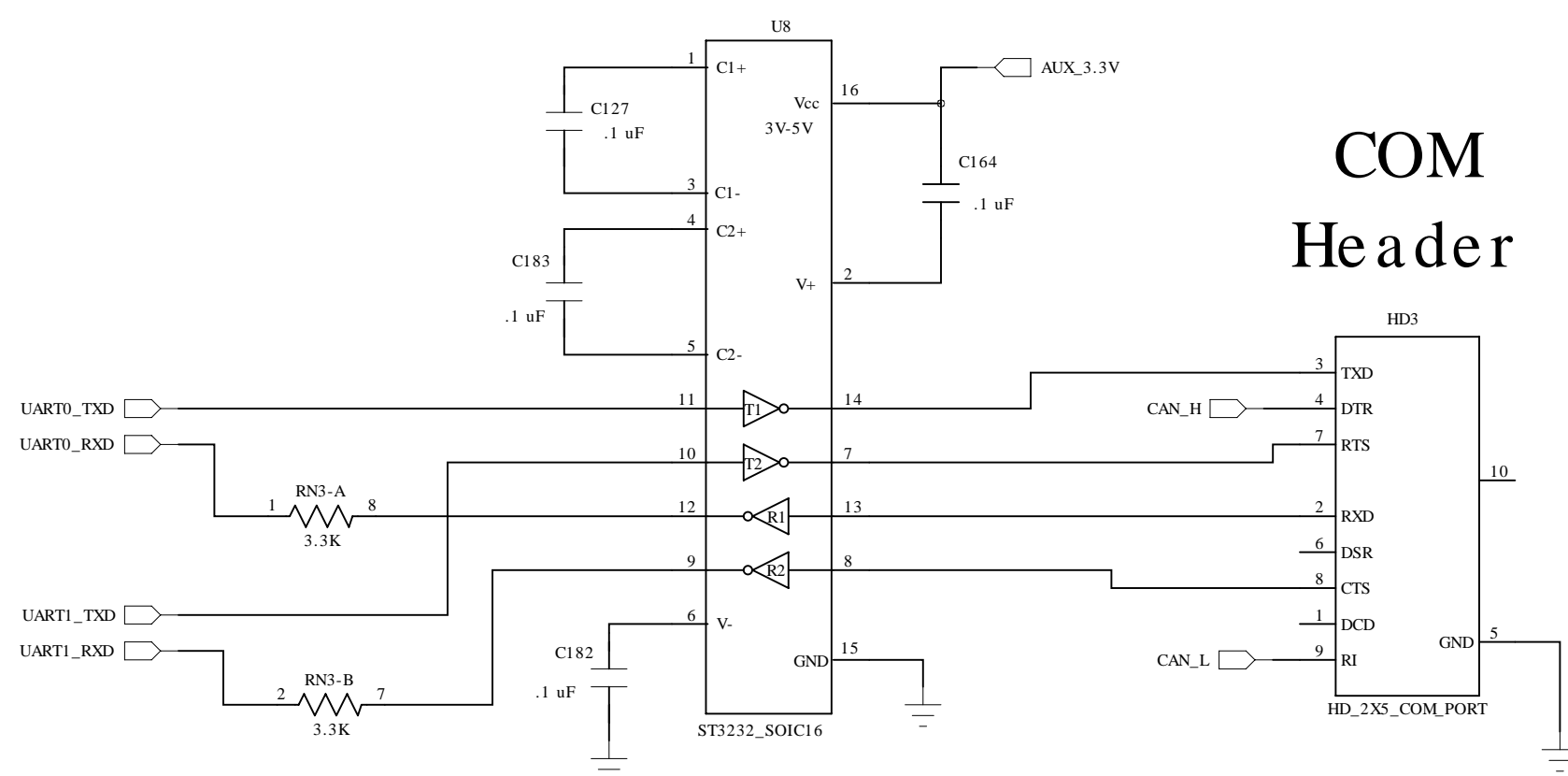
## RTC and Temp. Sensor



## Analog Inputs

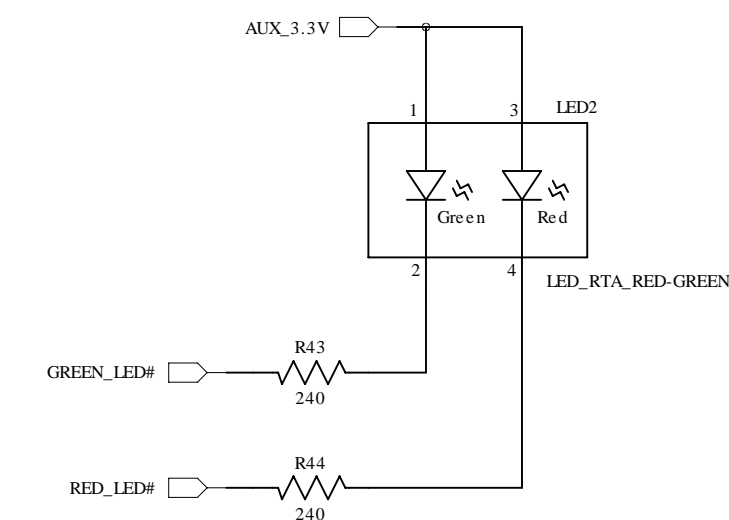


## RS-232 Tran.



COM  
Header

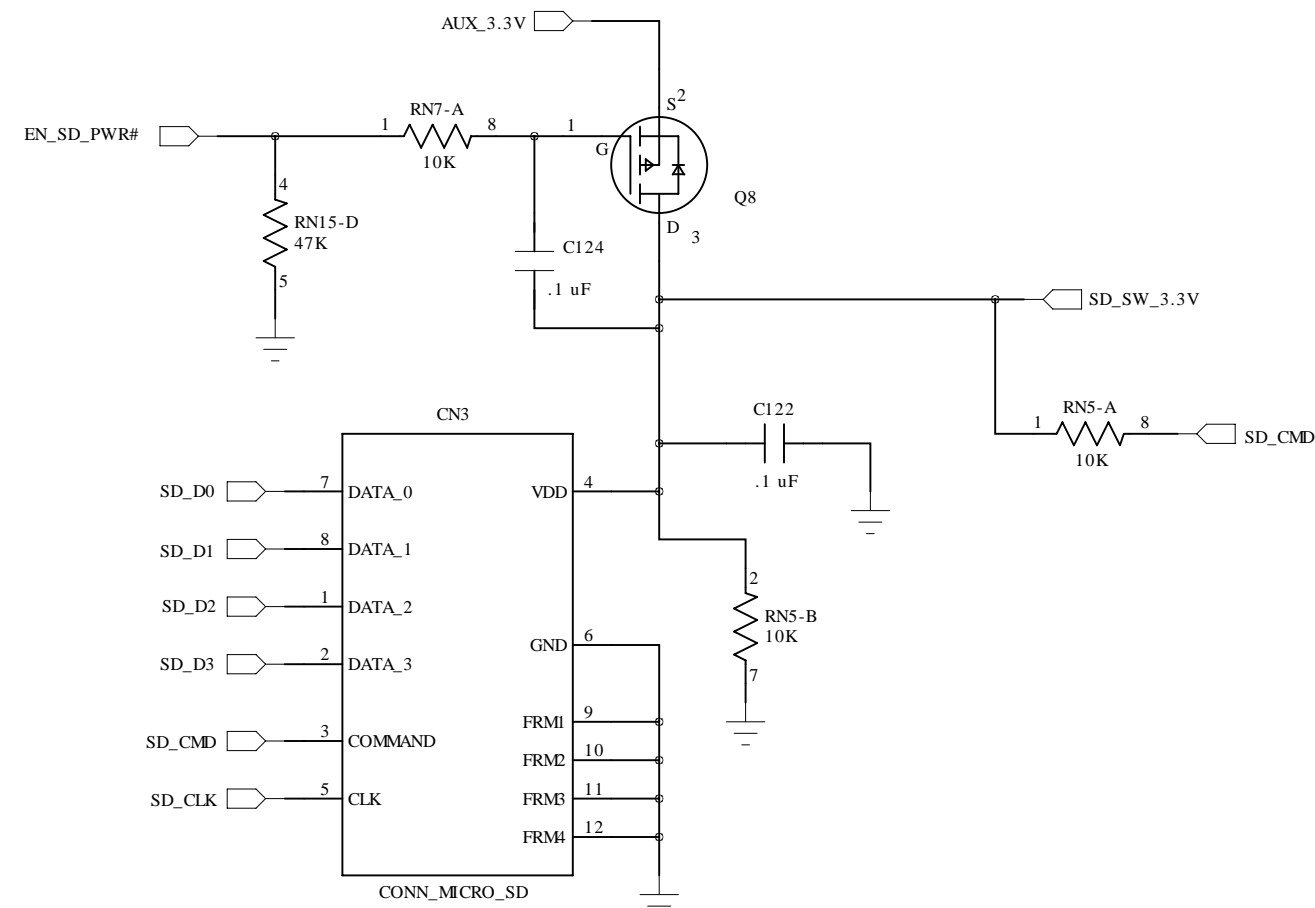
## Red/Green LEDs





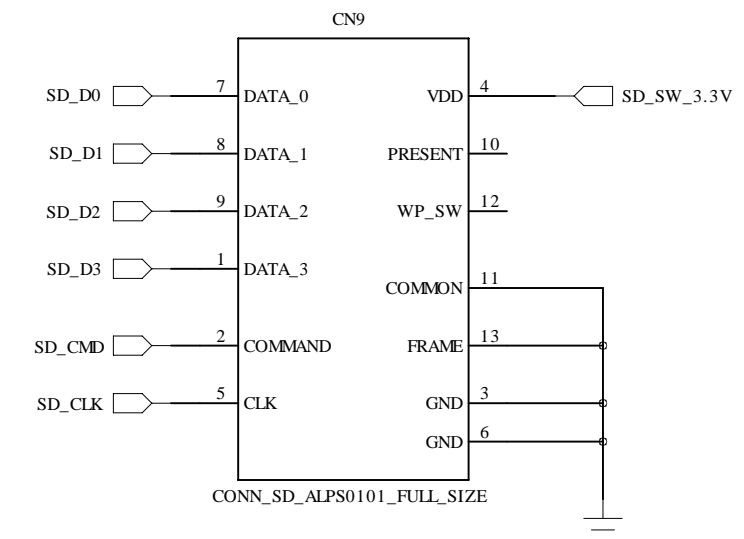
# Flash Memory

## Micro SD Card Socket

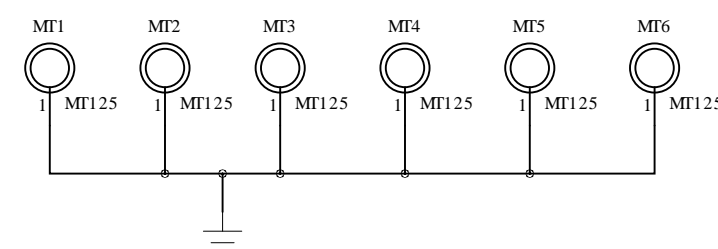
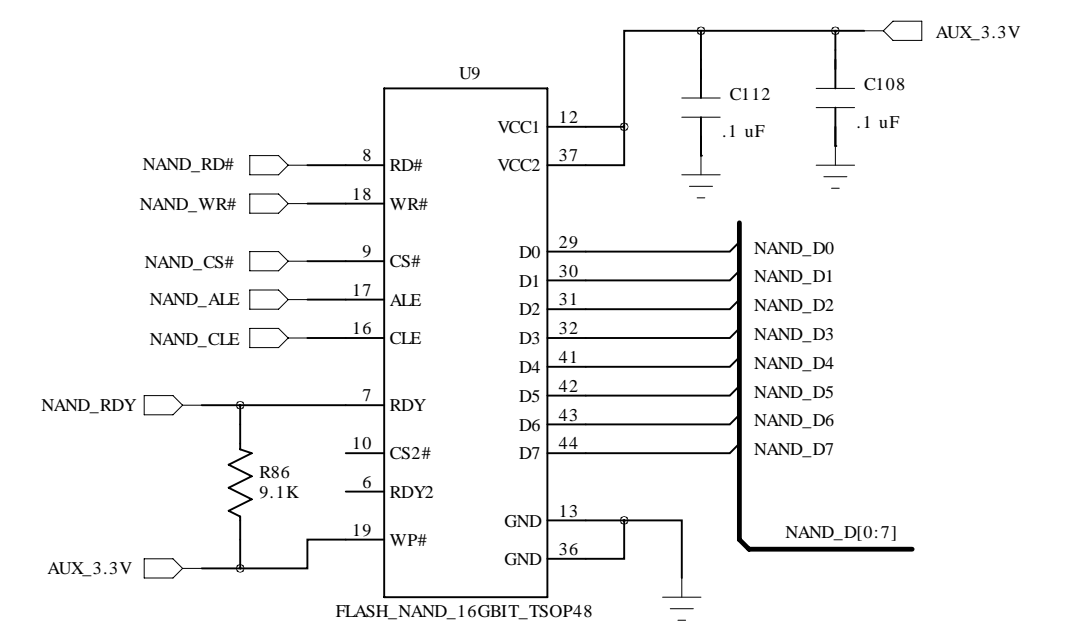


Only one SD card  
can be installed !

## Full Size SD Socket

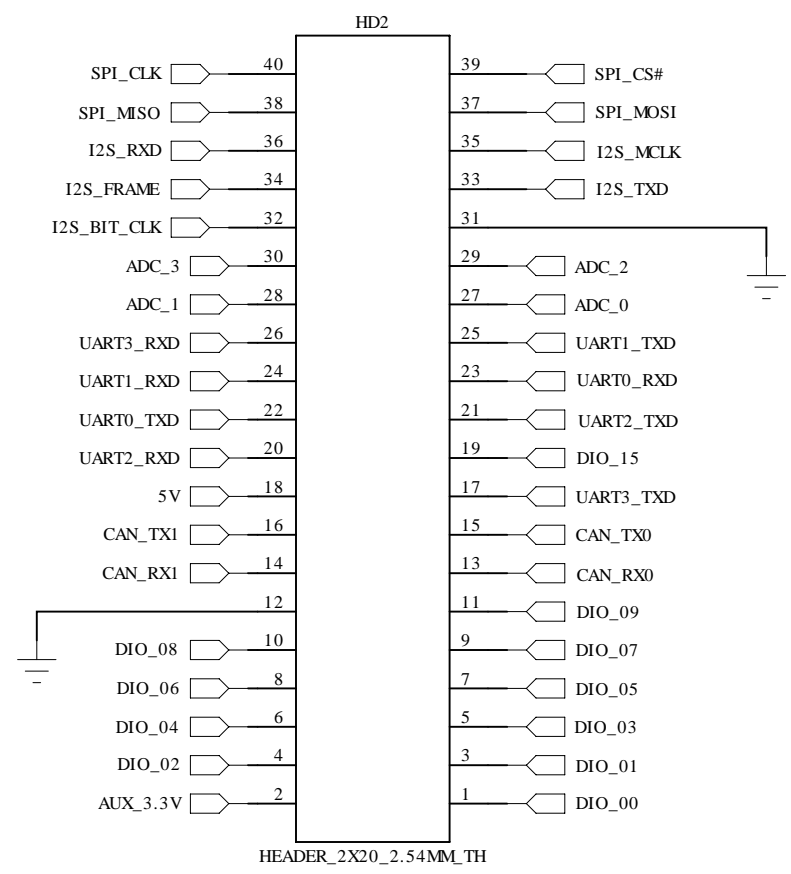


## NAND Flash

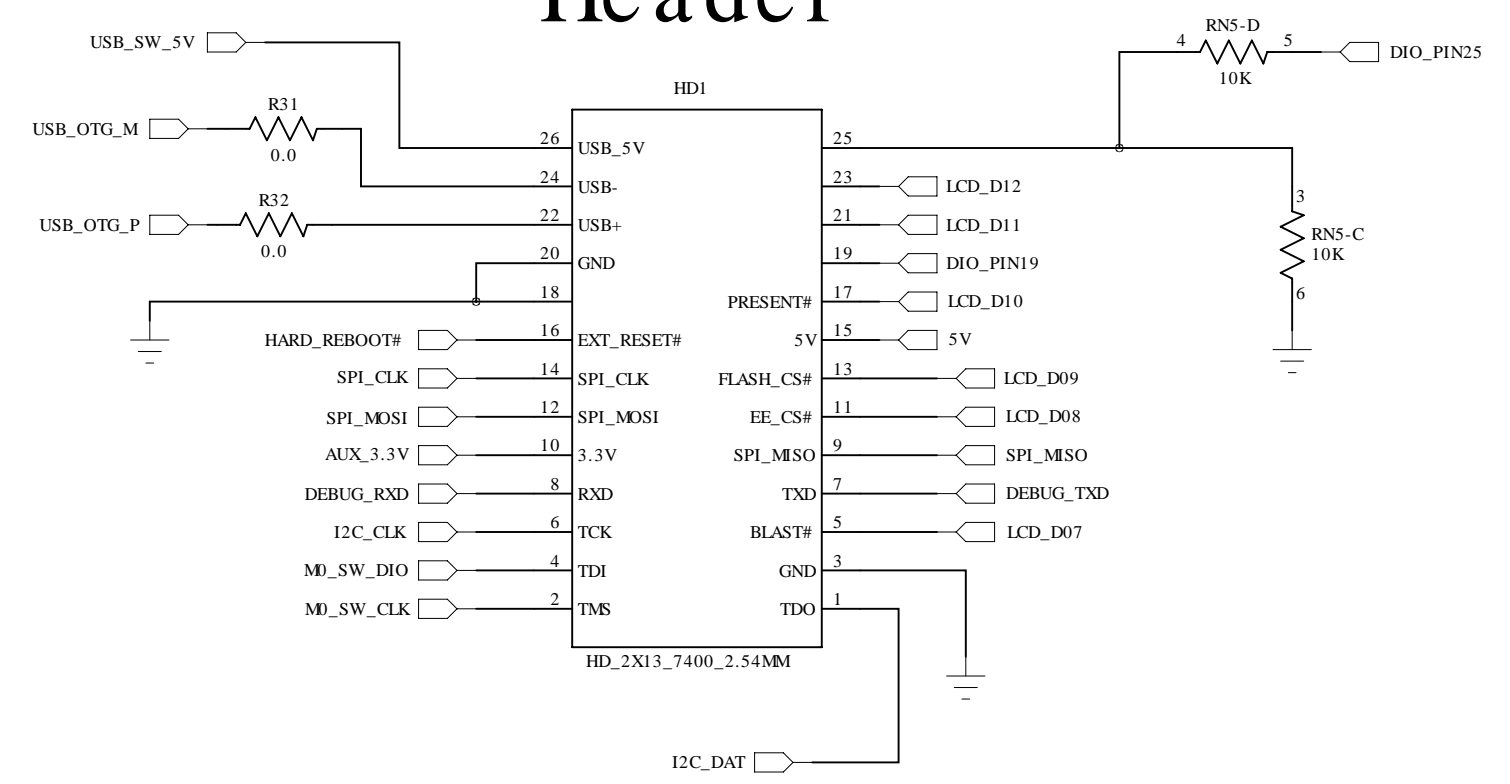


Technologic Systems	Date Dec. 31, 2013
Title: TS-7400_V2 SD Card, NAND, LEDs	
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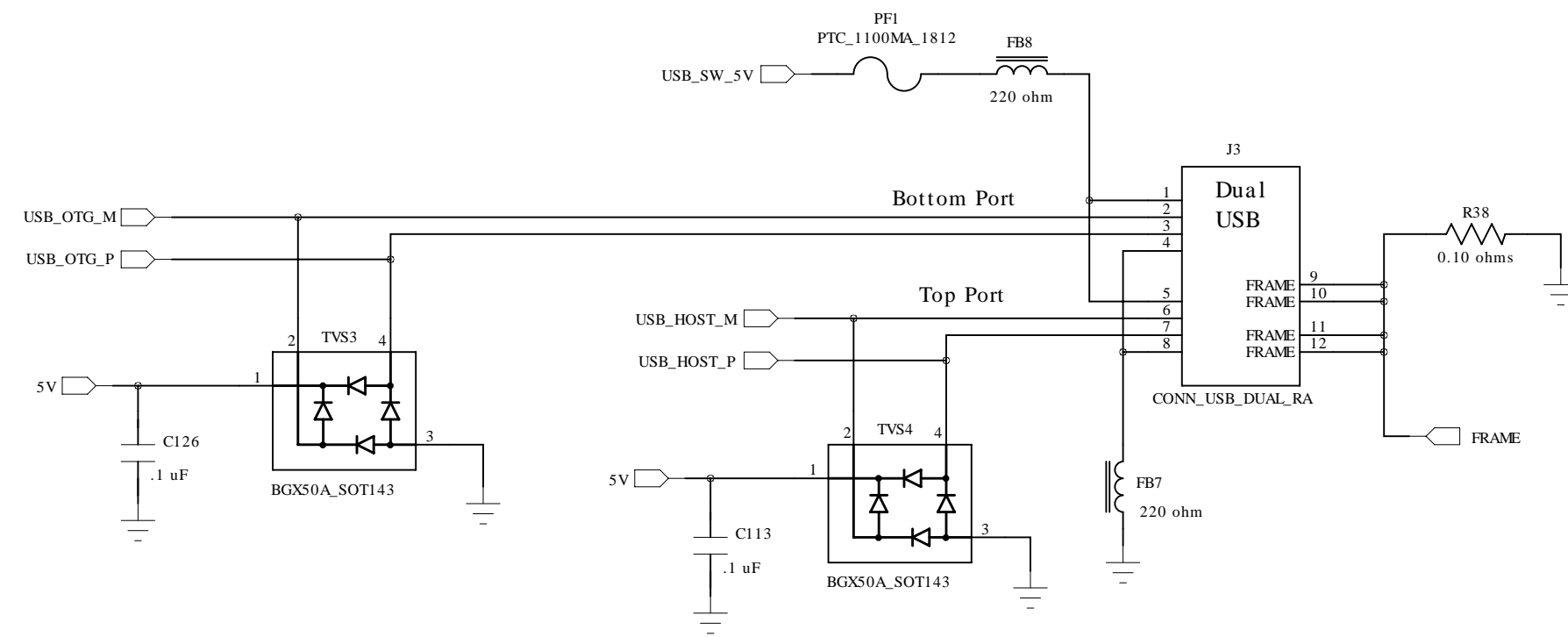
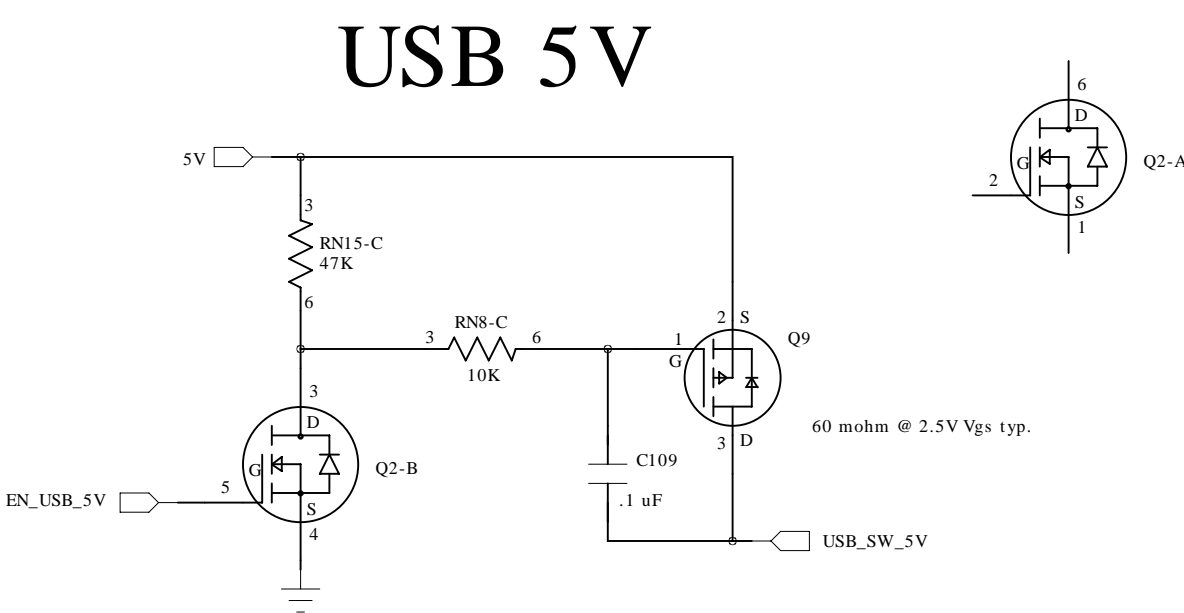
# 40-Pin DIO Header



# 26-Pin DIO Header



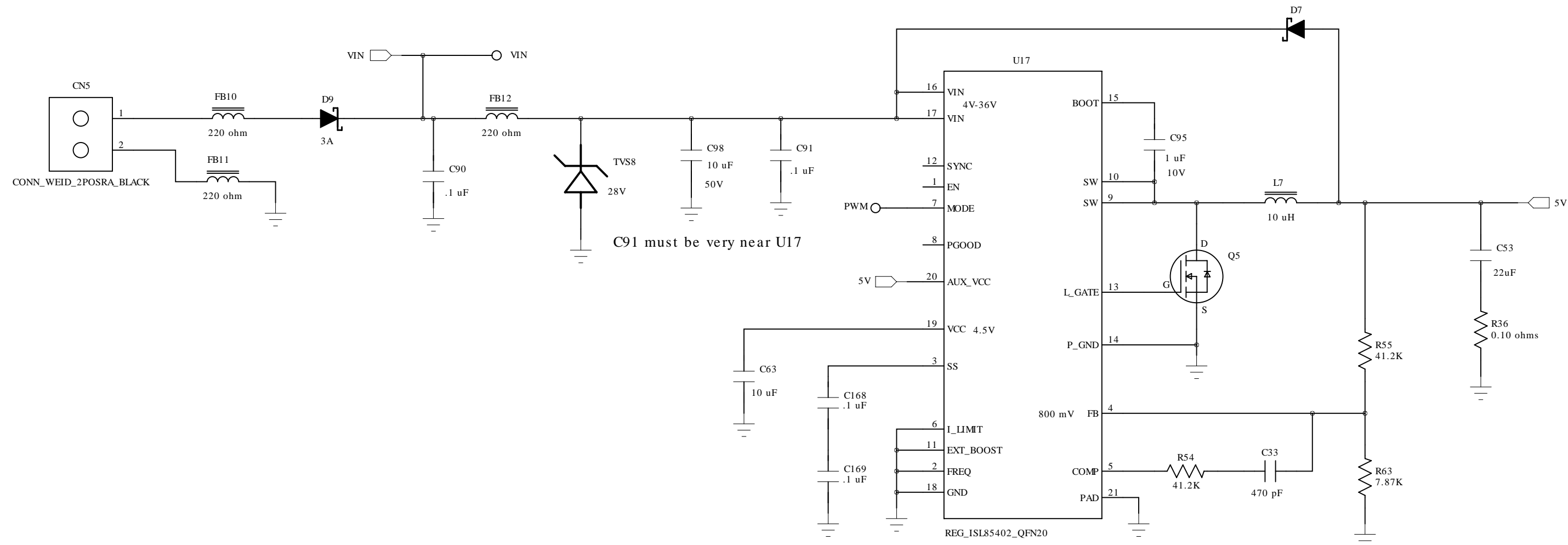
# USB Host Ports



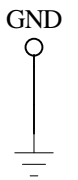
Technologic Systems	Date Dec. 31, 2013
Title: TS-7400_V2 44-pin, 26-pin DIO, USB	
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# 5V Power Supply (2000 mA)

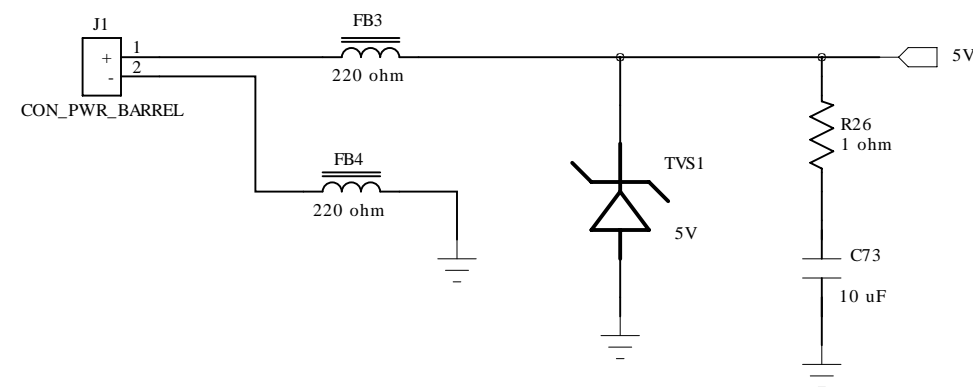
8-28 VDC  
Power Input



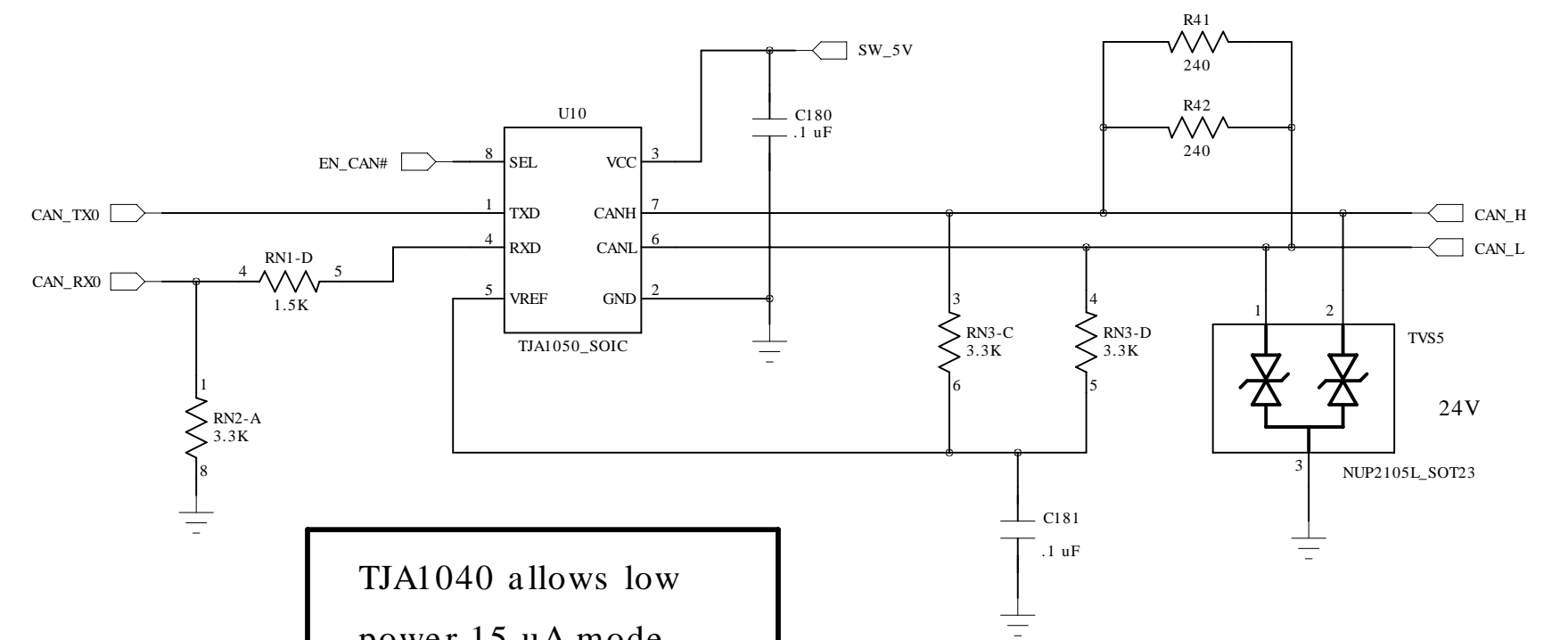
.063 hole



5V Power Barrel Conn.



CAN Transceiver



TJA1040 allows low power 15 uA mode

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Rev: A	Designer
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