



# TWR-MPC8309 Schematic

## SCHEMATIC PAGE DESCRIPTION:

- 01: Cover
- 02: Reset, Clock and Switch
- 03: DDR2 and NOR Flash Memory
- 04: eLBC, Latch, Buffer and Logics
- 05: Display, SD Card and CAN
- 06: Ethernet Interface and Clock
- 07: Ethernet PHYs and RJ45
- 08: USB Interface and USB PHY
- 09: RS485, RS232 and RS232 MUX
- 10: PCI Interface and Mini PCI Connector
- 11: Primary and Secondary Elevators
- 12: ColdFire MCU, IEEE1588, JTAG and I2C Device
- 13: Audio CODEC
- 14: MPC Decoupling
- 15: Power Supplies

## MAJOR REVISION HISTORY:

PCB REV.	SCM REV.	DESCRIPTION	DATE
30	A	Initial Version	4/12/2011
31	B	Production Version	9/14/2011
32	C	Modify Audio	10/26/2011

## PCB MECHANICAL DETAILS:

- 1: PCB SIZE: 90mm x 70mm
- 2: PCB MATERIAL: FR4
- 3: NUMBER OF LAYERS: 08
- 4: IMPEDENCE CONTROL: YES

## NOTES, UNLESS OTHERWISE SPECIFIED:

- 1. RESISTANCE TOLERANCE IS 5% IF NOT SPECIFIED
- 2. PARTS NOT INSTALLED ARE INDICATED WITH 'NP'.
- 3. SIGNAL NET NAMES WITH "#" SUFFIX, ARE ACTIVE LOW SIGNALS.
- 4. PACKAGE SIZE FOR DESCRETES IS "0402" IF NOT SPECIFIED

## VOLTAGE RAIL NOTATION

PWR RAIL	DESCRIPTION
+5V	5.0V Input voltage from sources
+5V_ELEV	5.0V Input/output voltage to/from tower system
+3.3V	3.3V MPC & Other I/O Voltage
+3.3V_ELEV	3.3V Output to Tower system
+1.8V	1.8V MPC & DDR I/O voltage
+1.0V	1.0V MPC Core Voltage

## I2C2 ADRESS DETAILS

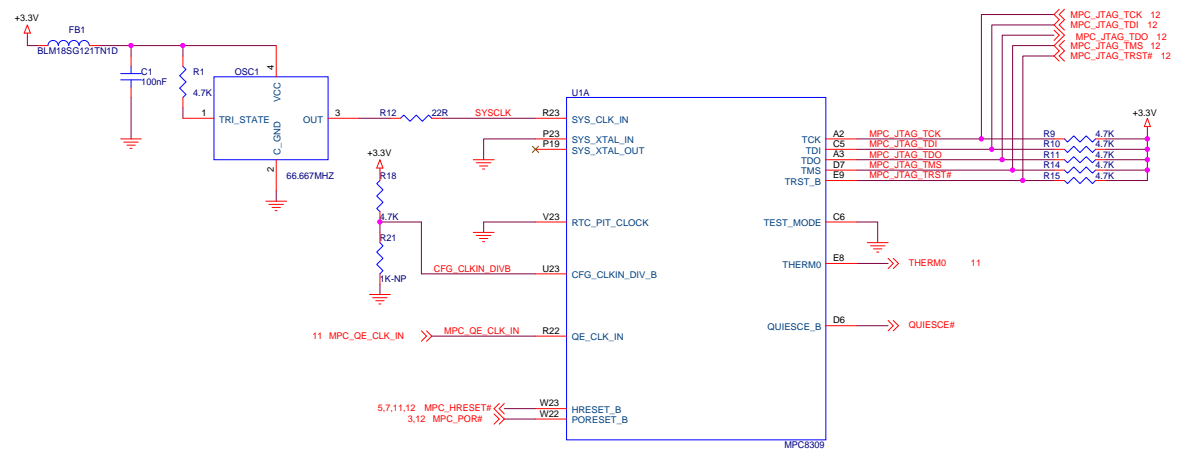
- 1. Audio CODEC, SGT15000 = 0x0A
- 2. Digital Accelerometer, MMA8541 = 0x1C
- 3. MPR121 on Display Module = 0x5B (ADDR pin = VDD)

## COMPONENT MOUNT / UNMOUNT NOTATIONS:

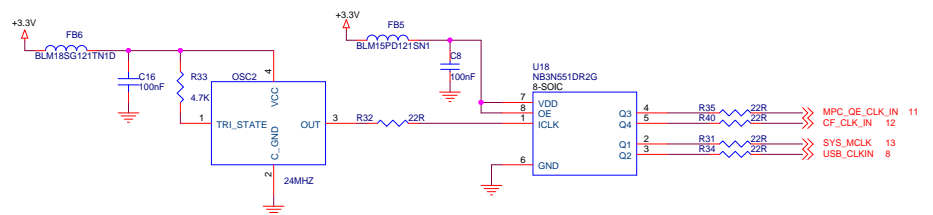
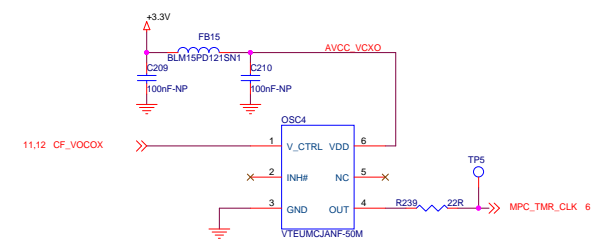
NOTATION (IN "MOUNTING" PROPERTY FIELD)	MOUNTING INSTRUCTIONS
BLANK	COMPONENT TO BE POPULATED
NP	NOT POPULATE



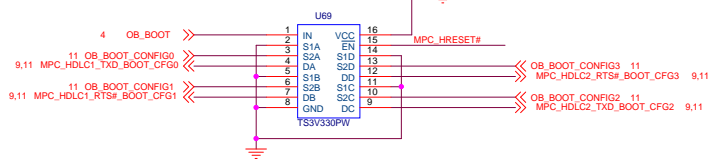
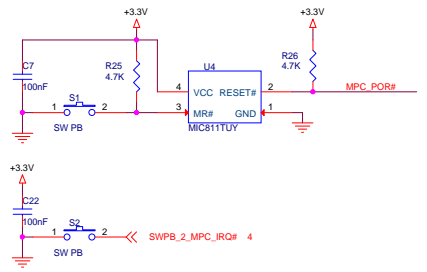
# MPC RESET, CLOCK & Switch



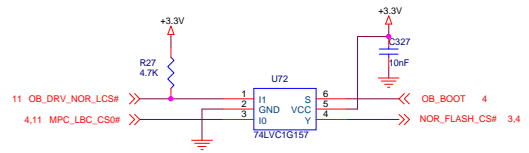
## IEEE1588 Clock Generation



## MPC Boot MUX



When IN=0, D=S1  
 Boot from on board NOR flash  
 When IN=1, D=S2  
 Boot from SD card



When S=0,  
 CS0# = ON BOARD FLASH CS  
 When S=1  
 CS0# = OFF BOARD CS

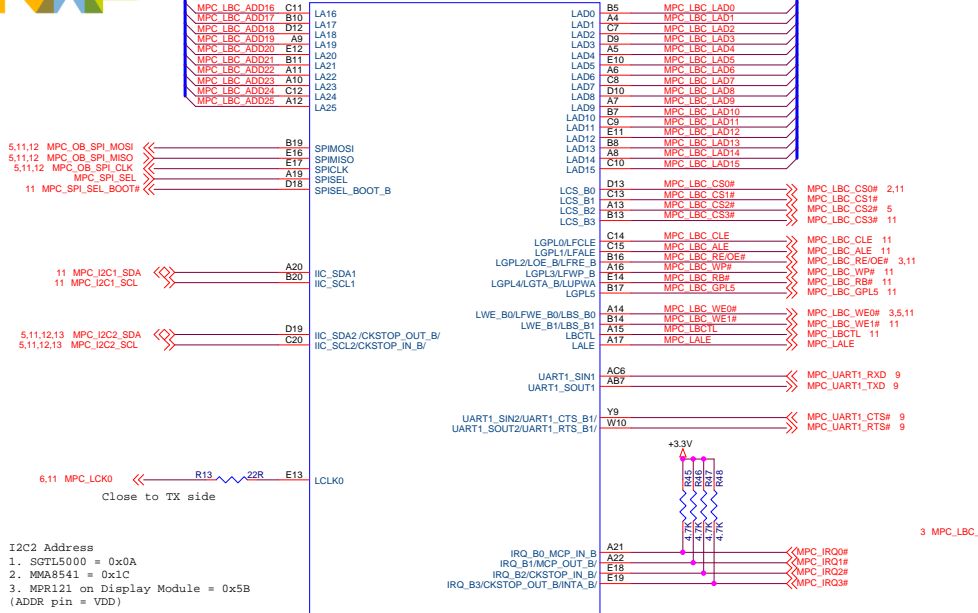
CFG_RESET SOURCE[0:3]	DESCRIPTION
0000	RCW from eLBC NOR (Default)
0001	RCW from eLBC NAND (small page 8-bit)
0010	Reserved
0011	Reserved
0100	RCW from I2C
0101	RCW from eLBC NAND (large page 8-bit)
0110	Reserved
0111	Reserved
1000	RCW hard-coded, boot from eLBC
1001	RCW hard-coded, boot from eLBC
1010	RCW hard-coded, boot from eLBC
1011	RCW from eLBC NOR
1100	RCW hard-coded, boot from eLBC
1101	RCW hard-coded, boot from eSDHC (OB_BOOT default)
1110	RCW hard-coded, boot from eSDHC
1111	RCW hard-coded, boot from SPI



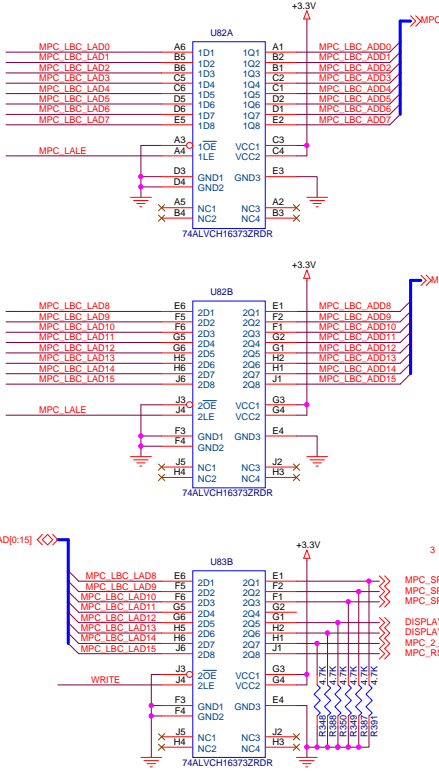


# MPC eLBC

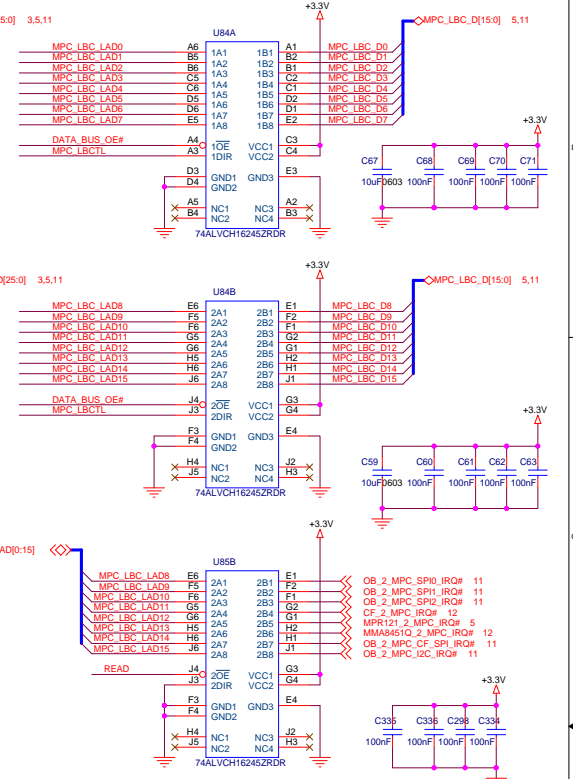
U1C MPC8309



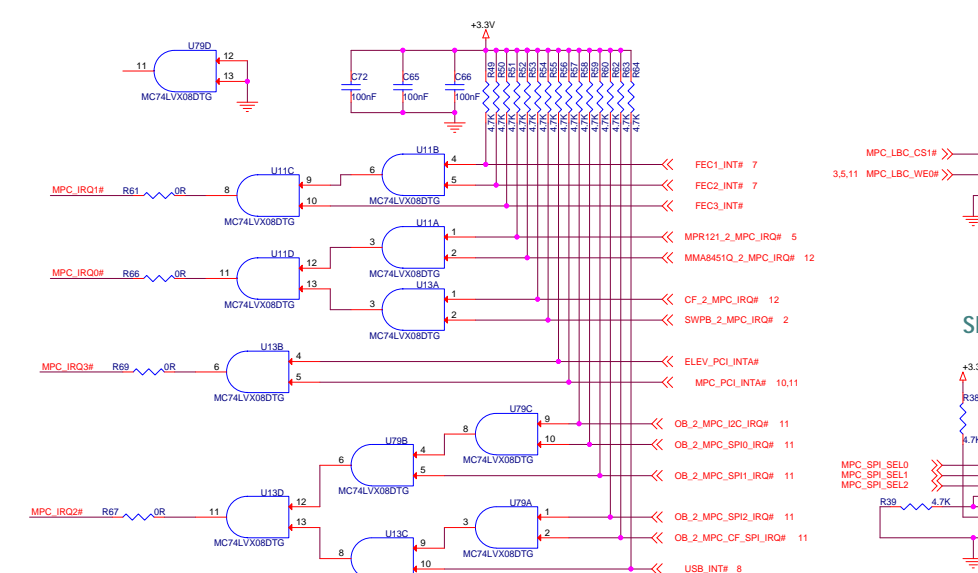
## Latches



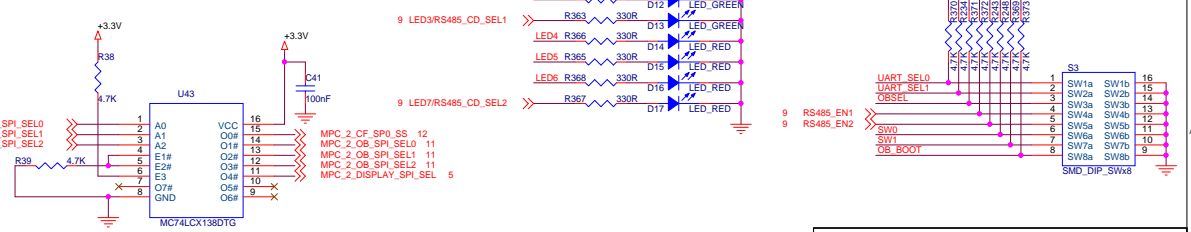
## Buffers



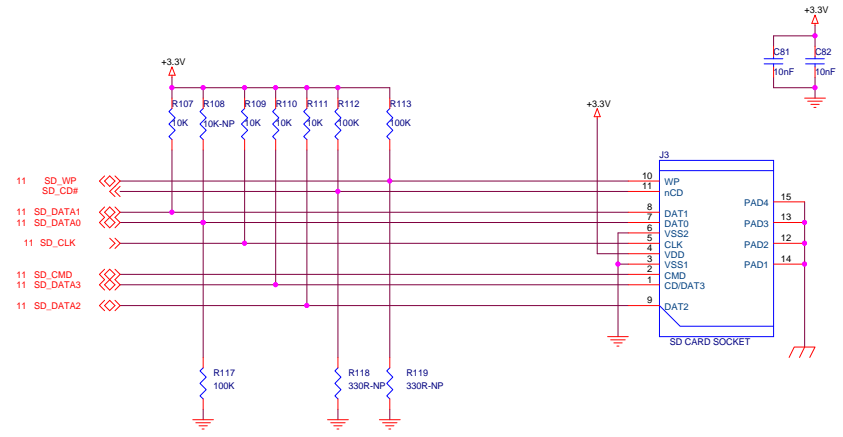
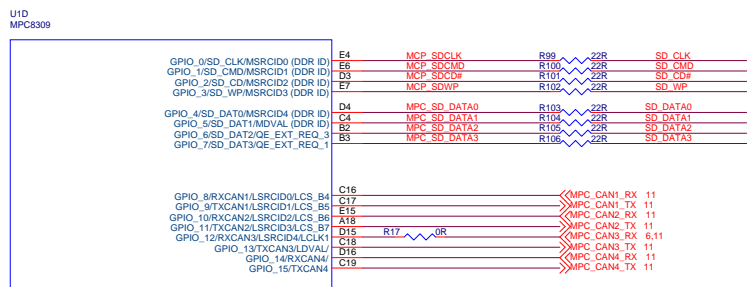
## MPC Interrupt



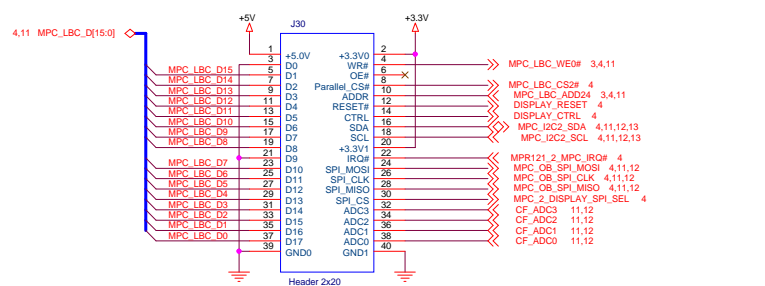
## SPI Routing Decode



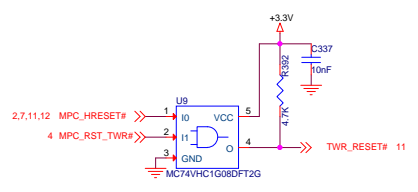
## Display, SD Card and CAN Signals



## Display Connector

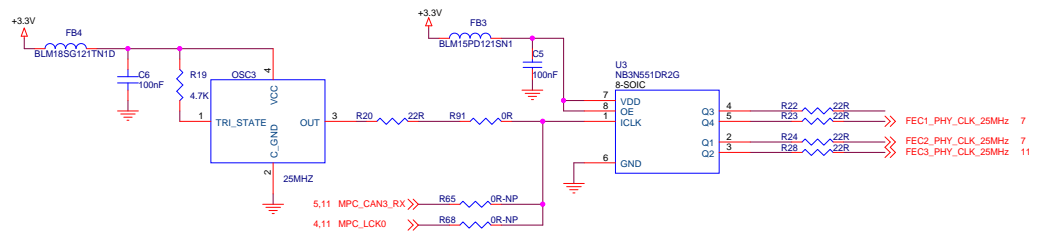
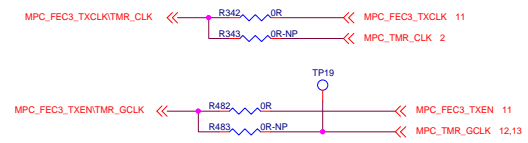
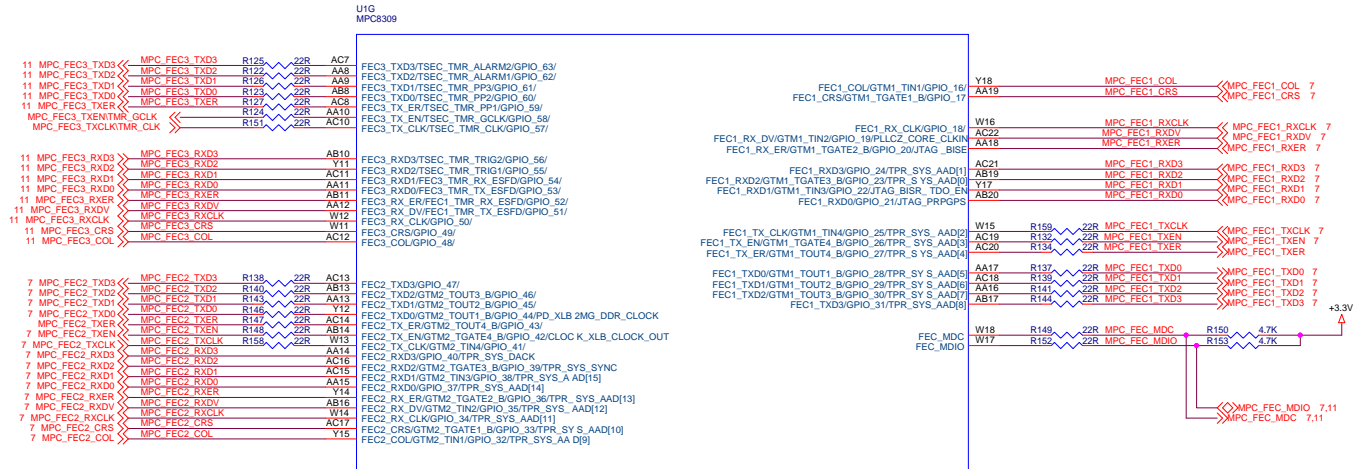


I2C2 Address = 0x5B  
Assume MPR121 on Display Module with ADDR pin = VDD



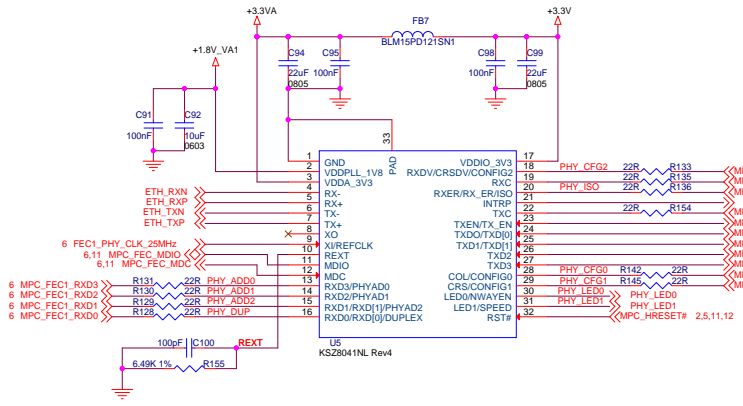


### MPC FEC1, FEC2 & FEC3

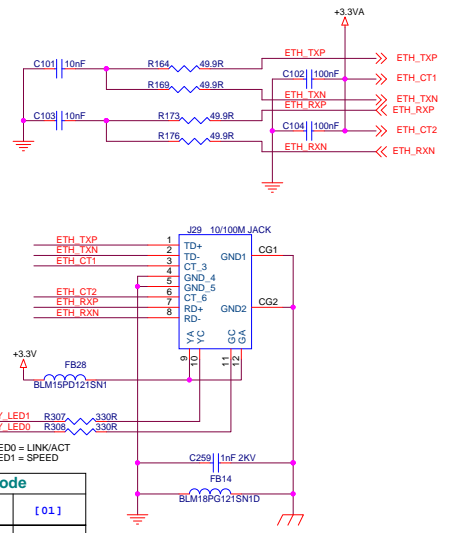




### 10/100 ETHERNET PHY

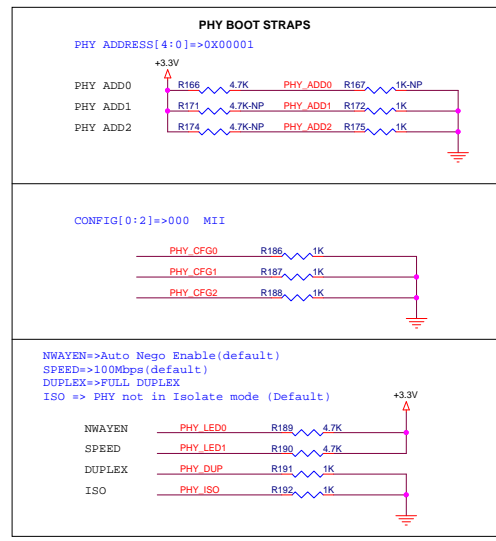


### 10/100 RJ45 with Magnetics

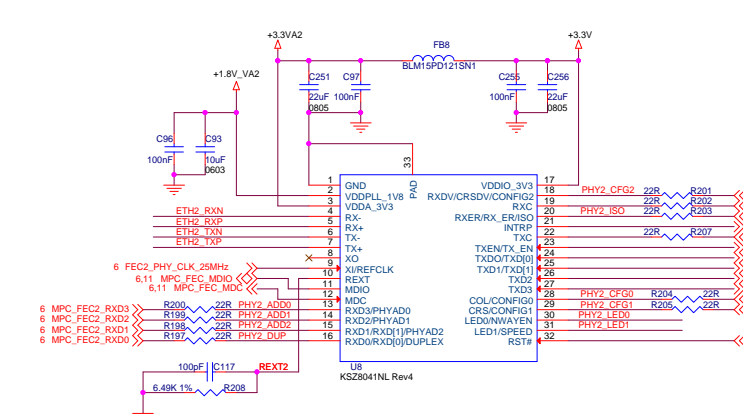


LED Mode		
LED #	[00]	[01]
LED0	LINK/ACT	LINK
LED1	SPEED	SPEED

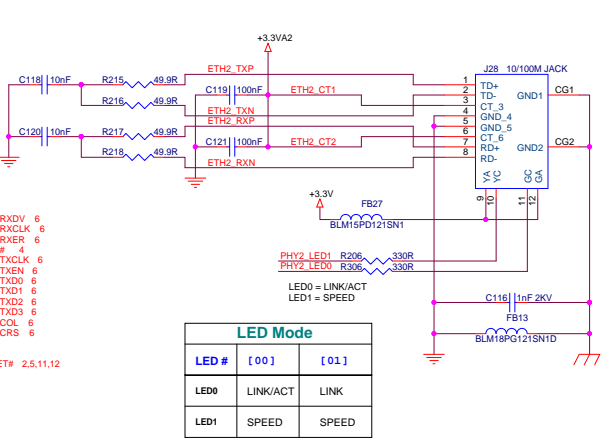
Note:  
Software: Configure LED mode for [00] setting



### 10/100 ETHERNET PHY

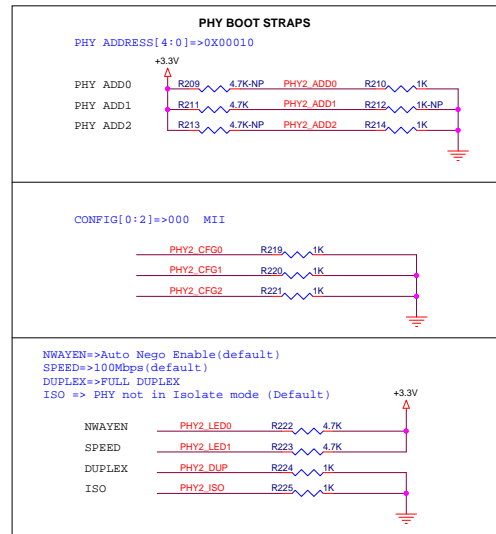


### 10/100 RJ45 with Magnetics



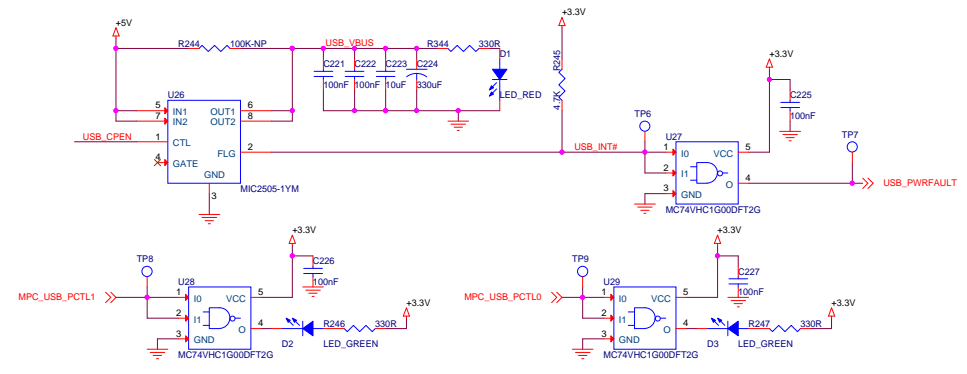
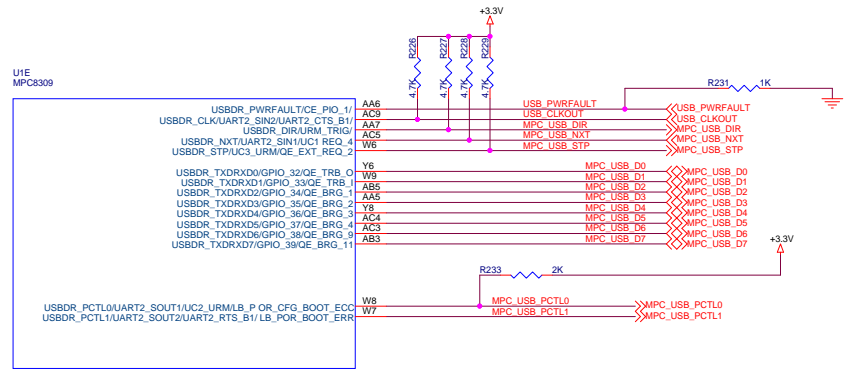
LED Mode		
LED #	[00]	[01]
LED0	LINK/ACT	LINK
LED1	SPEED	SPEED

Note:  
Software: Configure LED mode for [00] setting

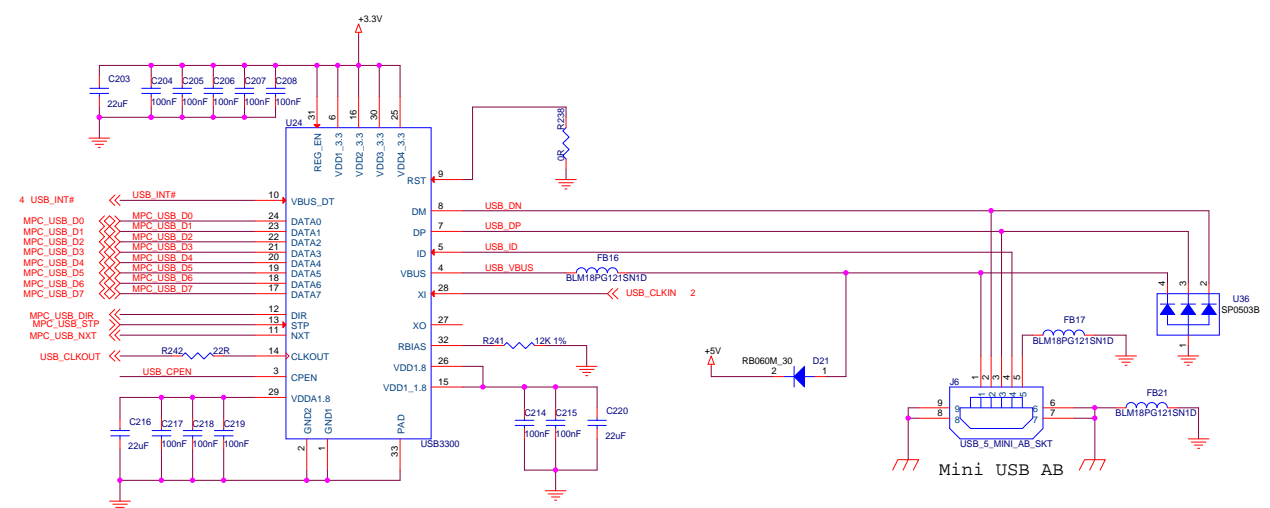




# USB Interface



# USB PHY

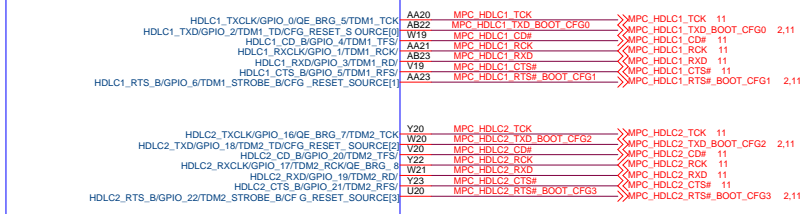




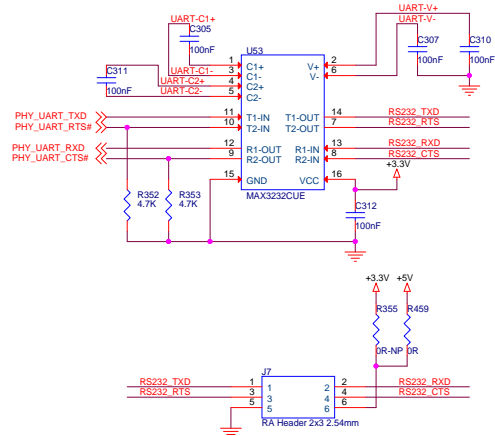


U1H  
MPC8309

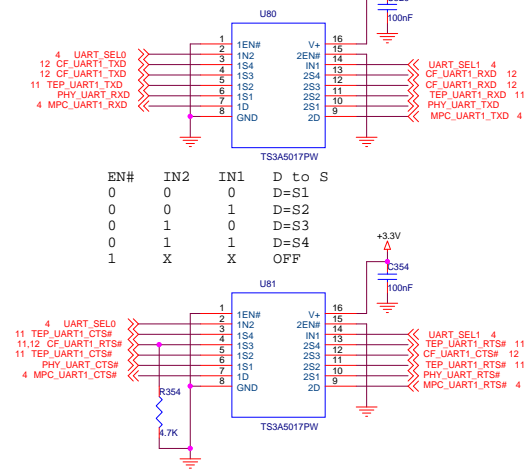
### MPC - HDLC



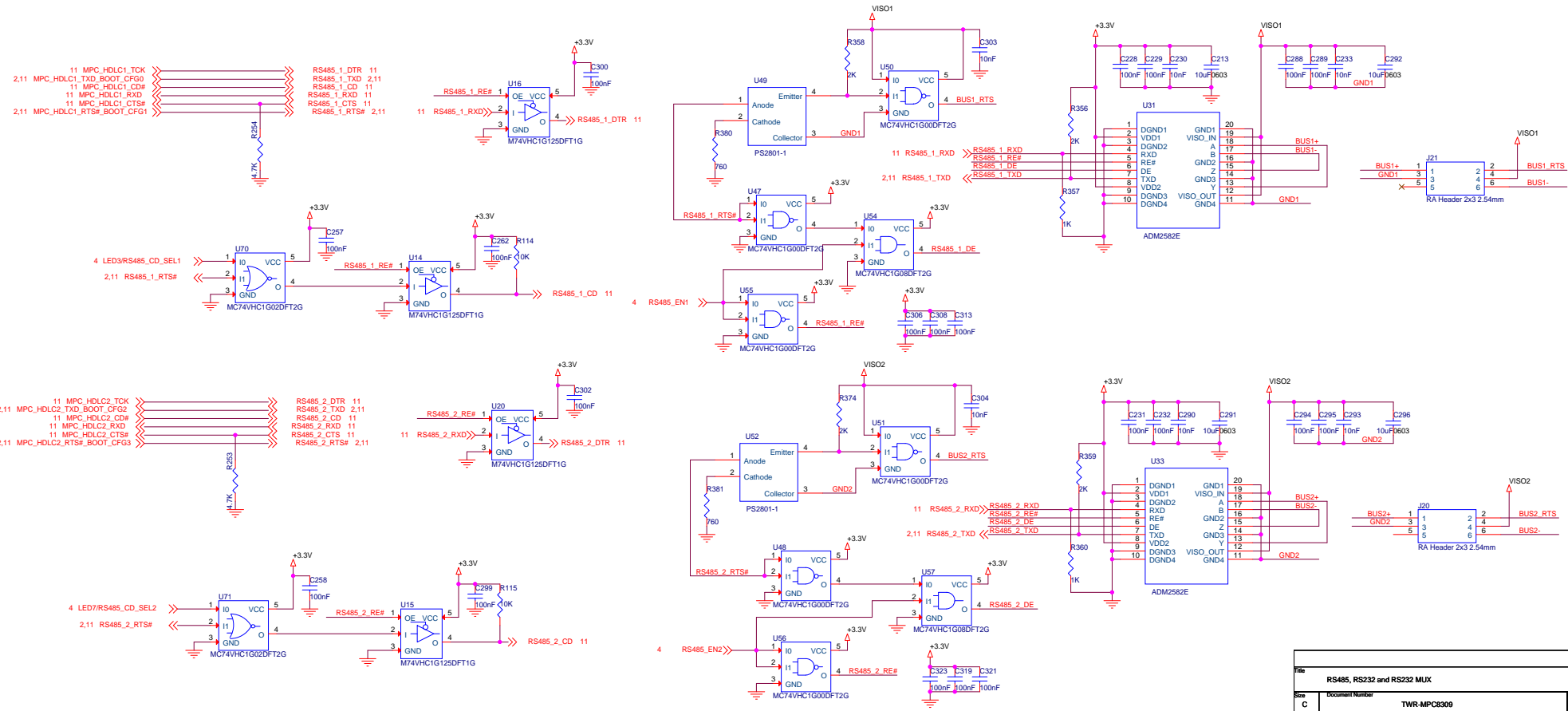
### RS232 PHY



### Quad 4:1 mux



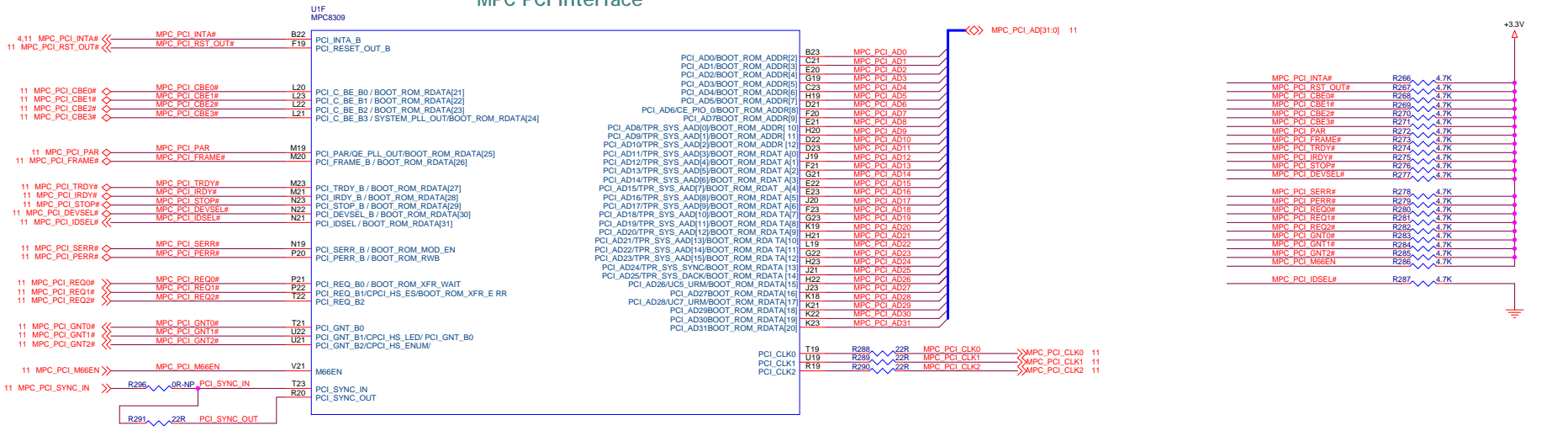
### UCC5 & UCC7 - RS485



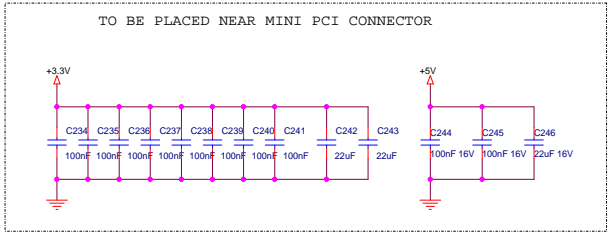
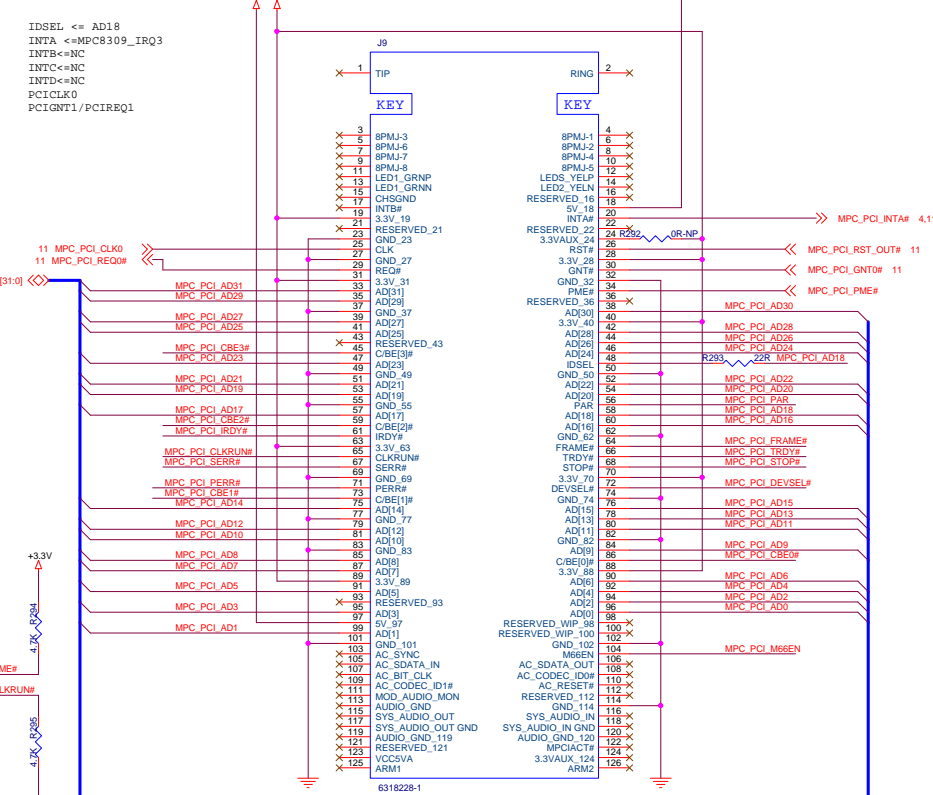
File	RS485, RS232 and RS232 MUX		
Doc C	Document Number	TWR-MPC8309	Rev C
Date	Wednesday, October 26, 2011	Sheet	9 of 15



# MPC PCI Interface



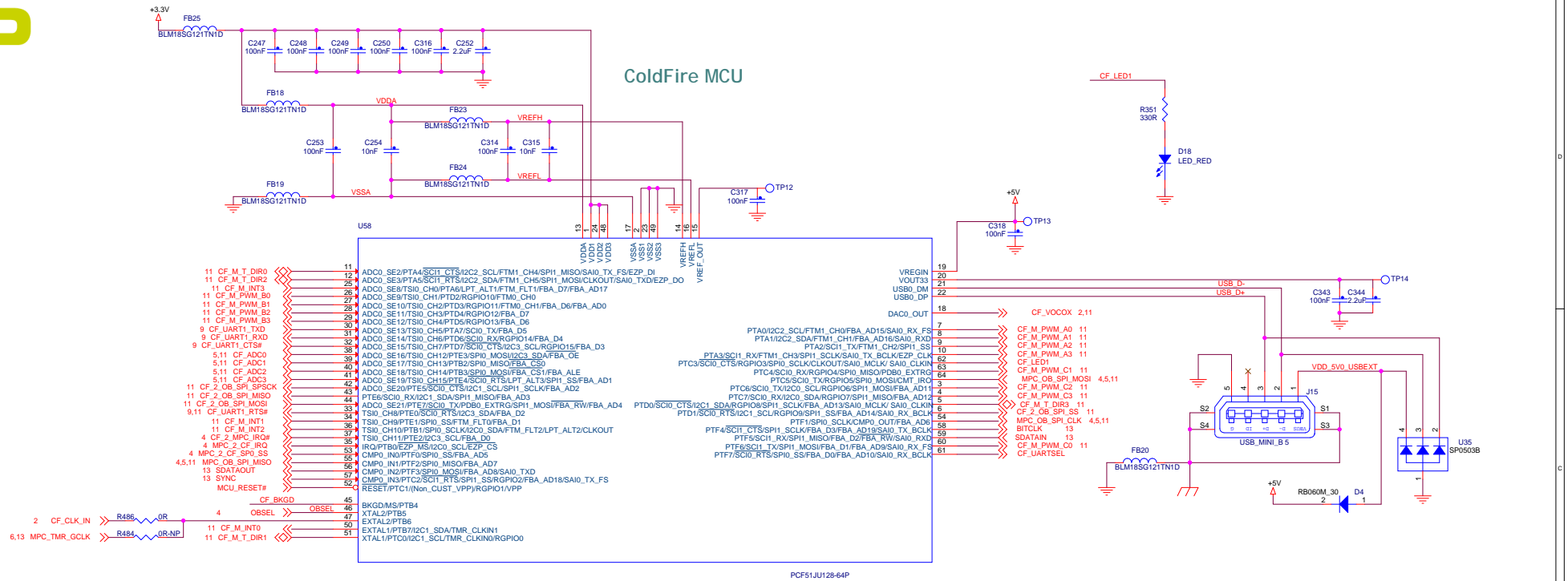
## Mini PCI Type3 Connector



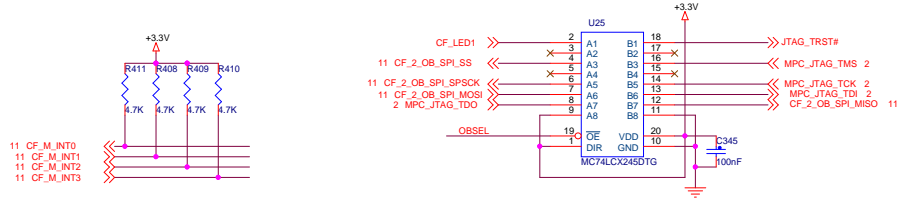




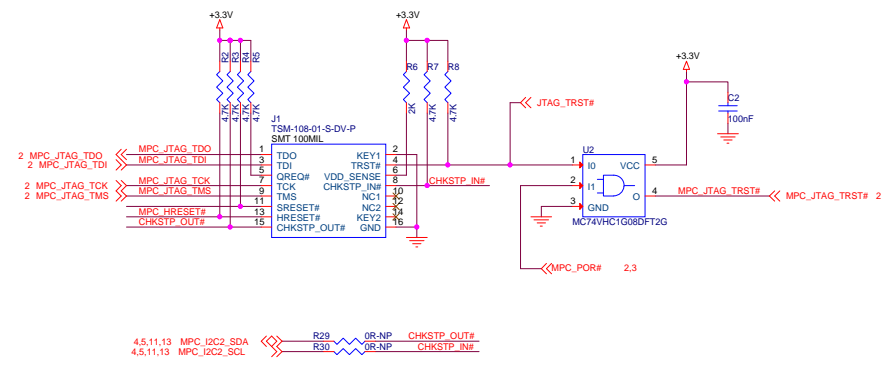
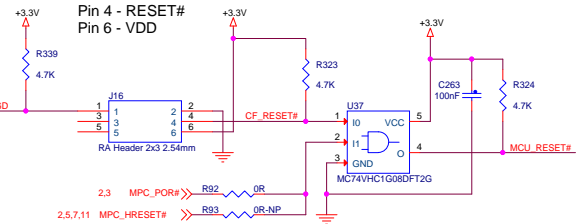
# ColdFire MCU



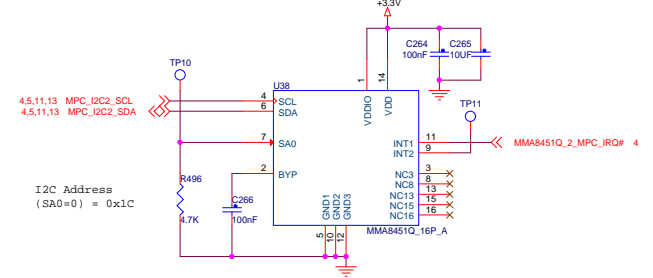
**Debugger Access:**  
 Pins:  
 Pin 1 - BKGD  
 Pin 2 - GND  
 Pin 4 - RESET#  
 Pin 6 - VDD



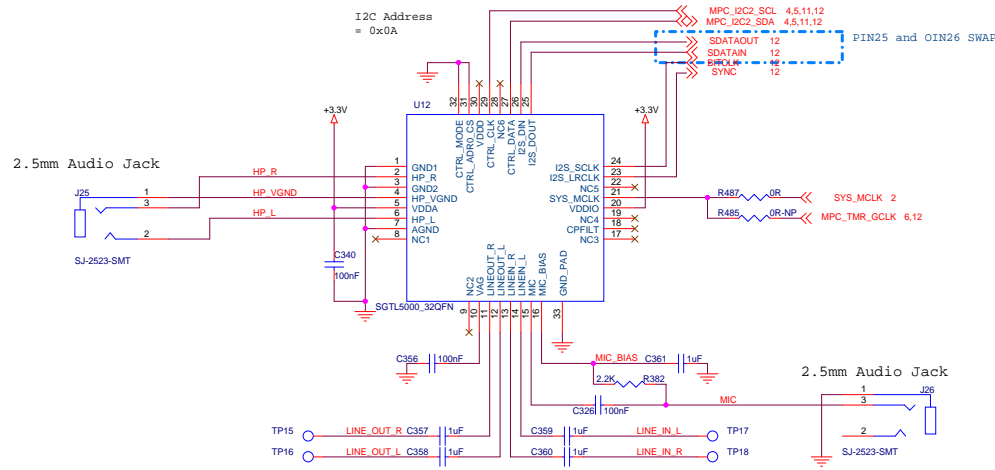
## MPC JTAG



## I2C Device



### Audio CODEC

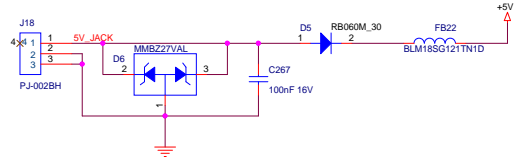




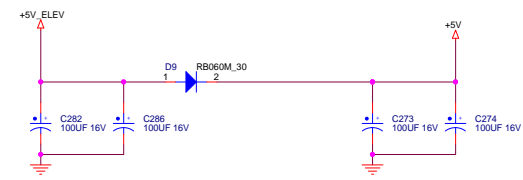


# Power Supplies

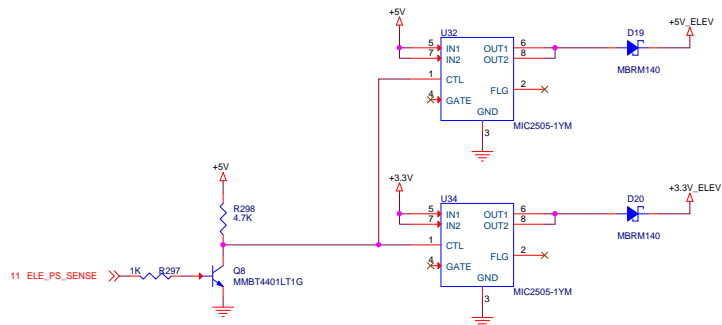
External Power Input



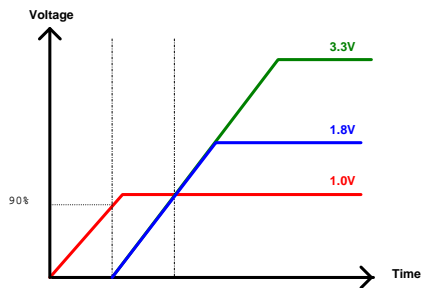
Tower Power Input



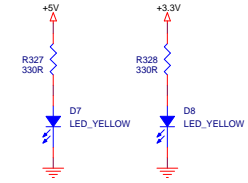
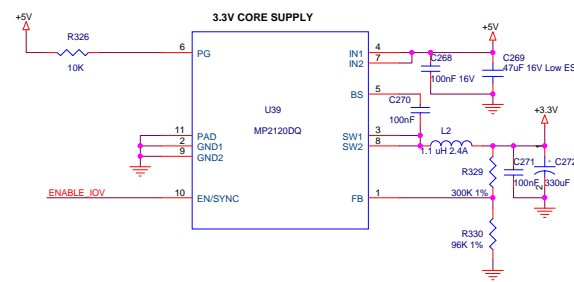
When ELE\_PS\_SENSE = 0,  
Drive on board +3.3V to +3.3V\_ELEV and +5V to +5V\_ELEV  
When ELE\_PS\_SENSE = 1,  
Disconnect +3.3V\_ELEV from on board +3.3V and +5V\_ELEV from +5V



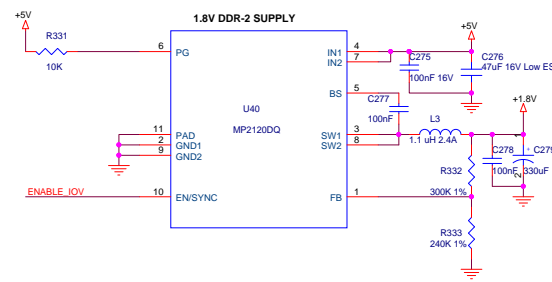
Power-up Sequence



3.3V @ 2.5A POWER SUPPLY



1.8V @ 2.5A POWER SUPPLY



1.0V @ 2.5A POWER SUPPLY

