

PROJECT:	MCF54xx
PART NUMBER:	1004421
ASSEMBLY NAME:	SOM-ETX FIRE ENGINE
SCHEMATICS:	KL, MS, CM
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9	POWER SUPPLIES
10	COLDFIRE PROCESSOR
11	GRAPHICS CONTROLLER
12	TEST POINTS
13	ECO LIST

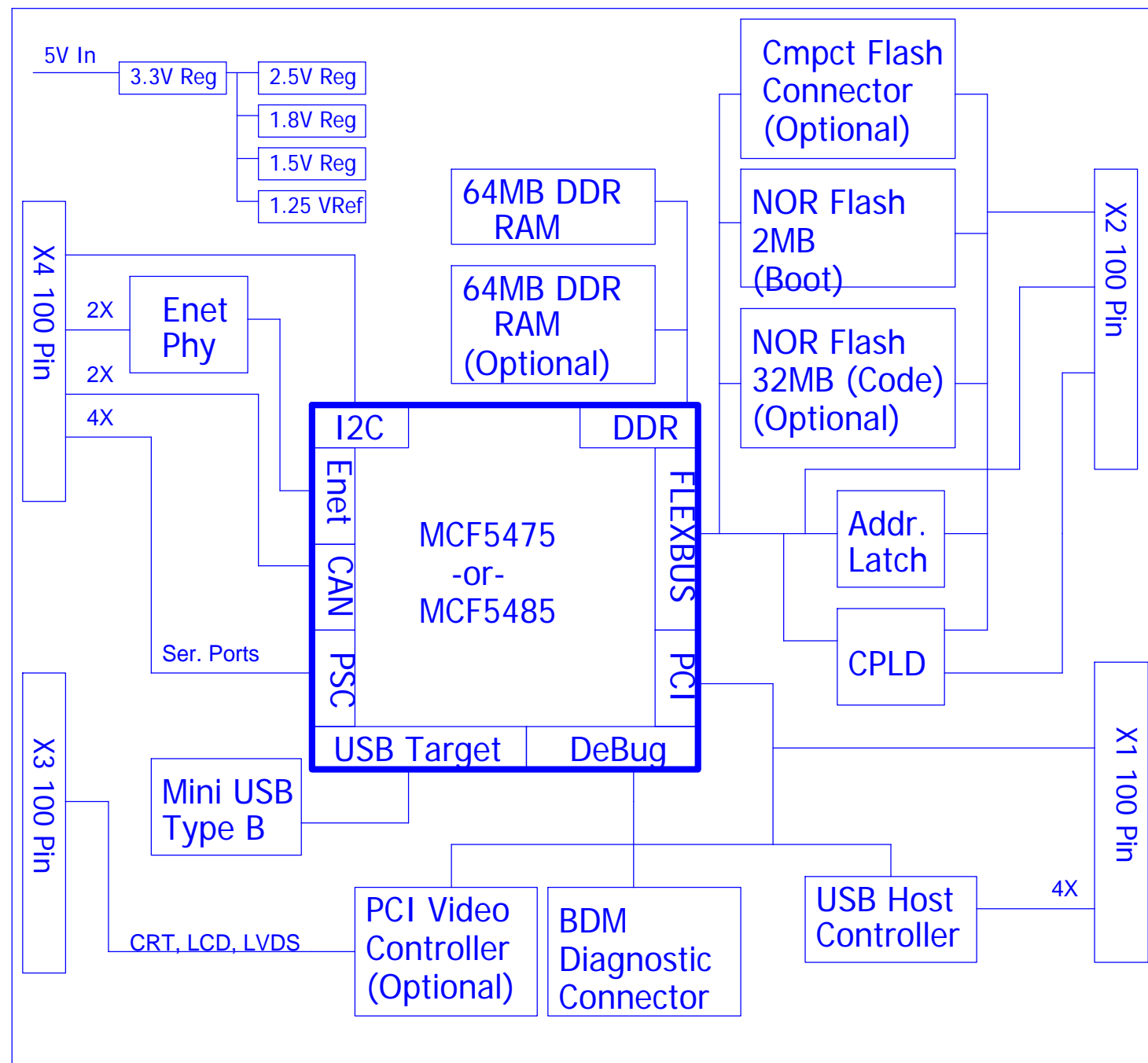
**COLOR LEGEND**

**NOTE:**  
NOTES IN GREEN TEXT ARE GENERAL DESIGN OR SCHEMATIC NOTES

**LAYOUT NOTE:**  
NOTES IN RED TEXT ARE PCB LAYOUT RECOMMENDATIONS OR GUIDLINES

**NET NAMES**  
NET NAMES IN GREEN TEXT ARE NETS THAT ARE NOT DIRECTLY CONNECTED WITH A VISIBLE WIRE ON SINGLE SCHEMATIC PAGE, BUT USE THIS CONVENTION TO MAKE THE SCHEMATIC EASIER TO READ

**NET NOTE**  
NET NOTES IN BLACK TEXT INDICATE A PARTICULAR FUNCTIONALITY OF A SPECIFIC NET, IT IS NOT A NET NAME MERELY TEXT AND HAS NO AFFECT ON THE DRC.



PCB1  
MCF54xx Fire Engine  
17000062

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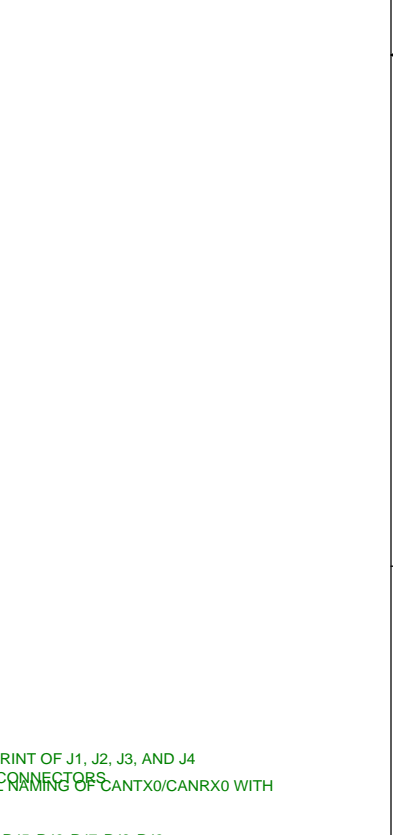
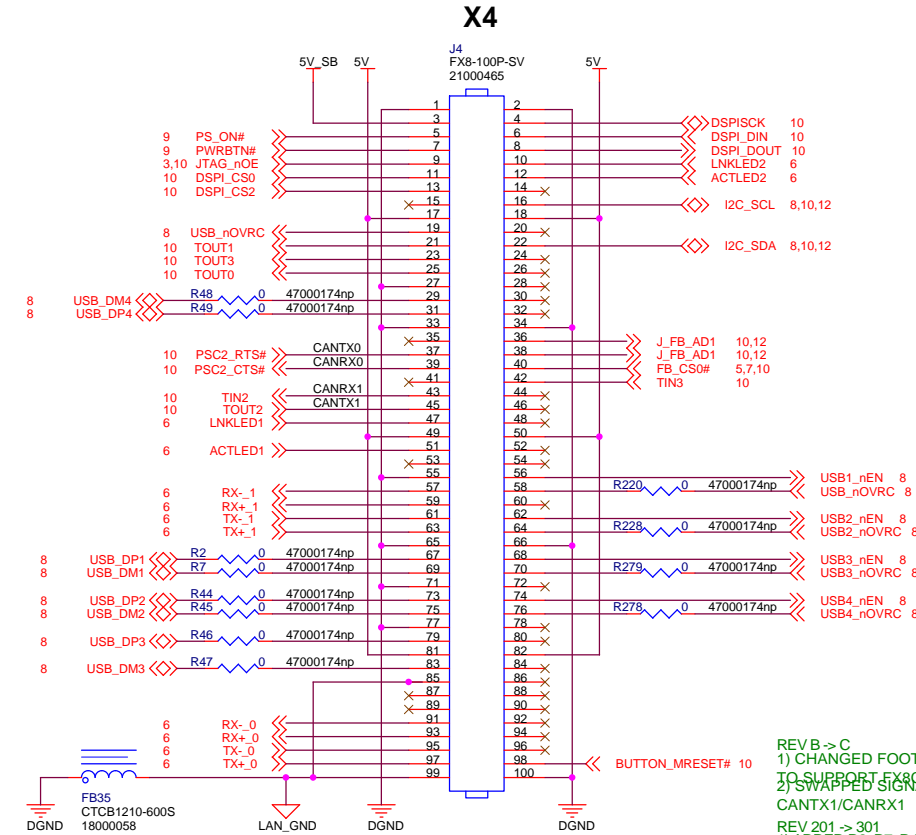
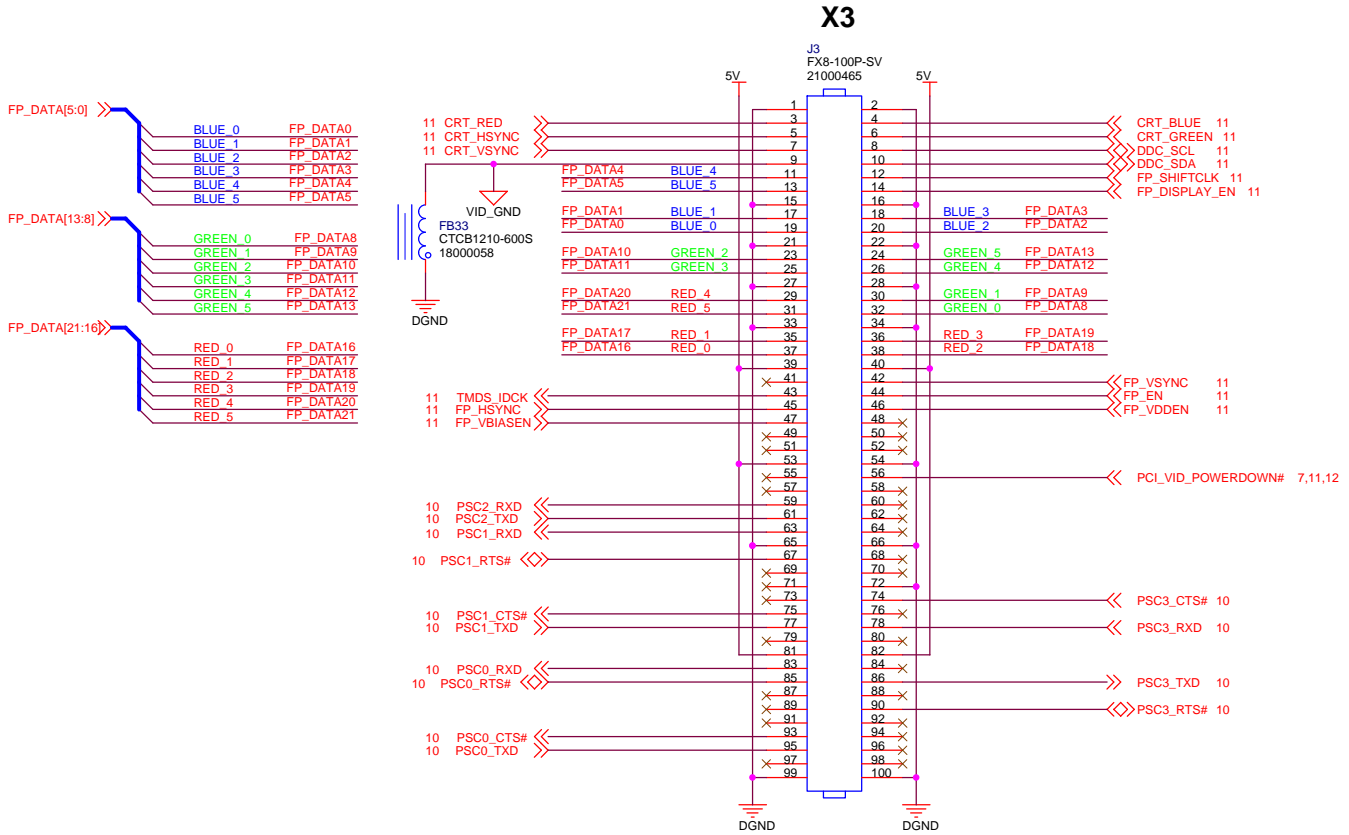
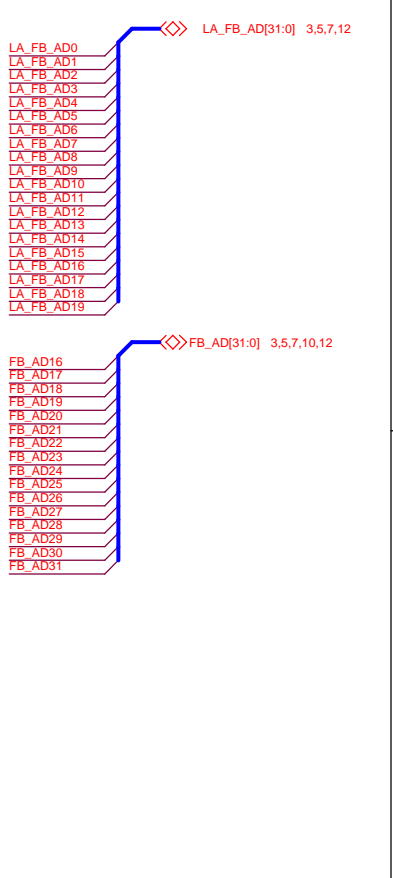
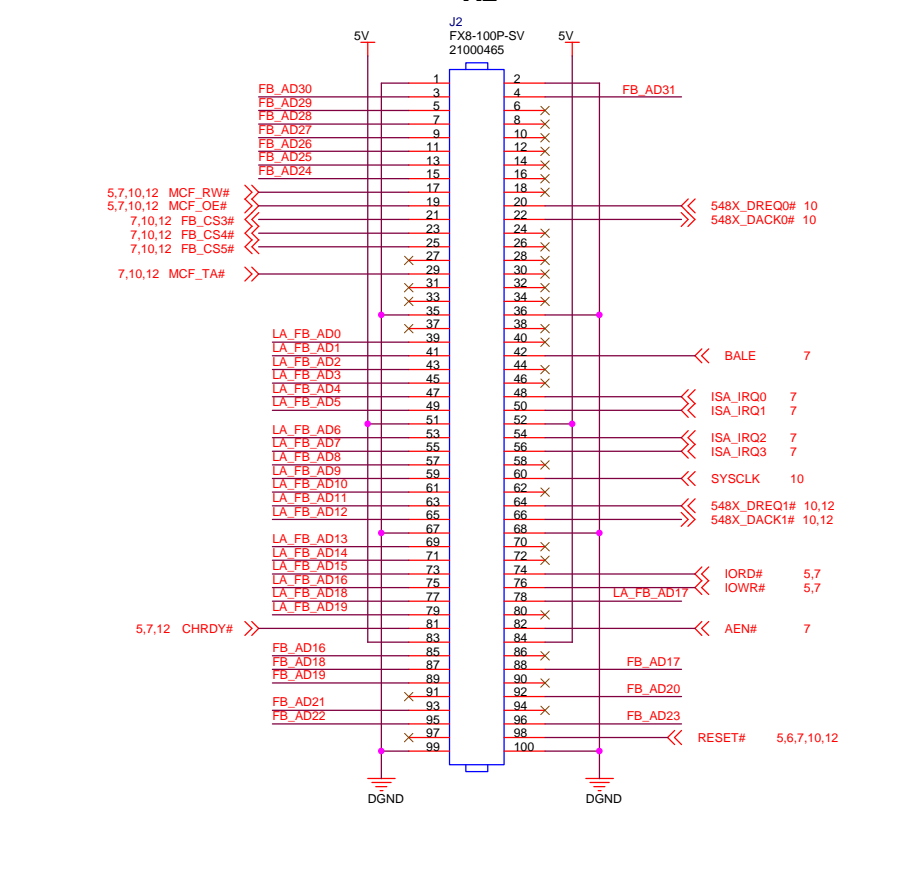
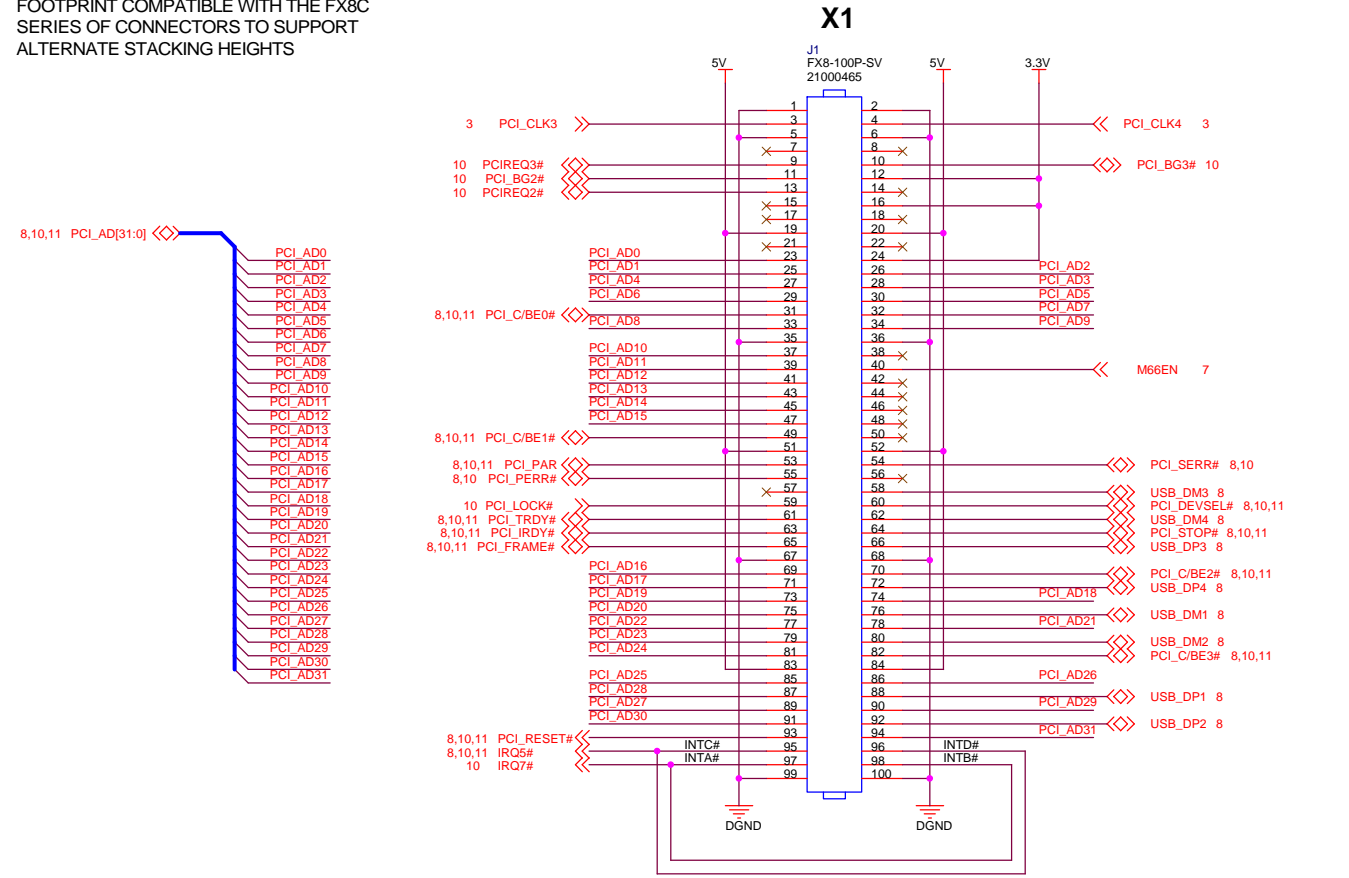
- NOTES:**
- PCI ID\_SEL pins:
    - Slot 1 = PCI\_AD20 (offboard)
    - Slot 2 = PCI\_AD21 (offboard)
    - USBHC = PCI\_AD17
    - Video Controller = PCI\_AD18
  - Flat panel interface is 18-bit, R, G, B.

Schematic Modify Date = Tuesday, February 20, 2007

		<b>LOGIC</b> PRODUCT DEVELOPMENT	411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489
Title ETX Fire Engine, Block Diagram			
Size C	Number 1004421	Rev G	
Date Friday, February 20, 2004	Project MOT-ETX	Sheet 1 Of 13	

NOTE: J1, J2, J3, J4 HAVE PCB PADS FOOTPRINT COMPATIBLE WITH THE FX8C SERIES OF CONNECTORS TO SUPPORT ALTERNATE STACKING HEIGHTS

## 02 - ETX EXPANSION CONNECTORS

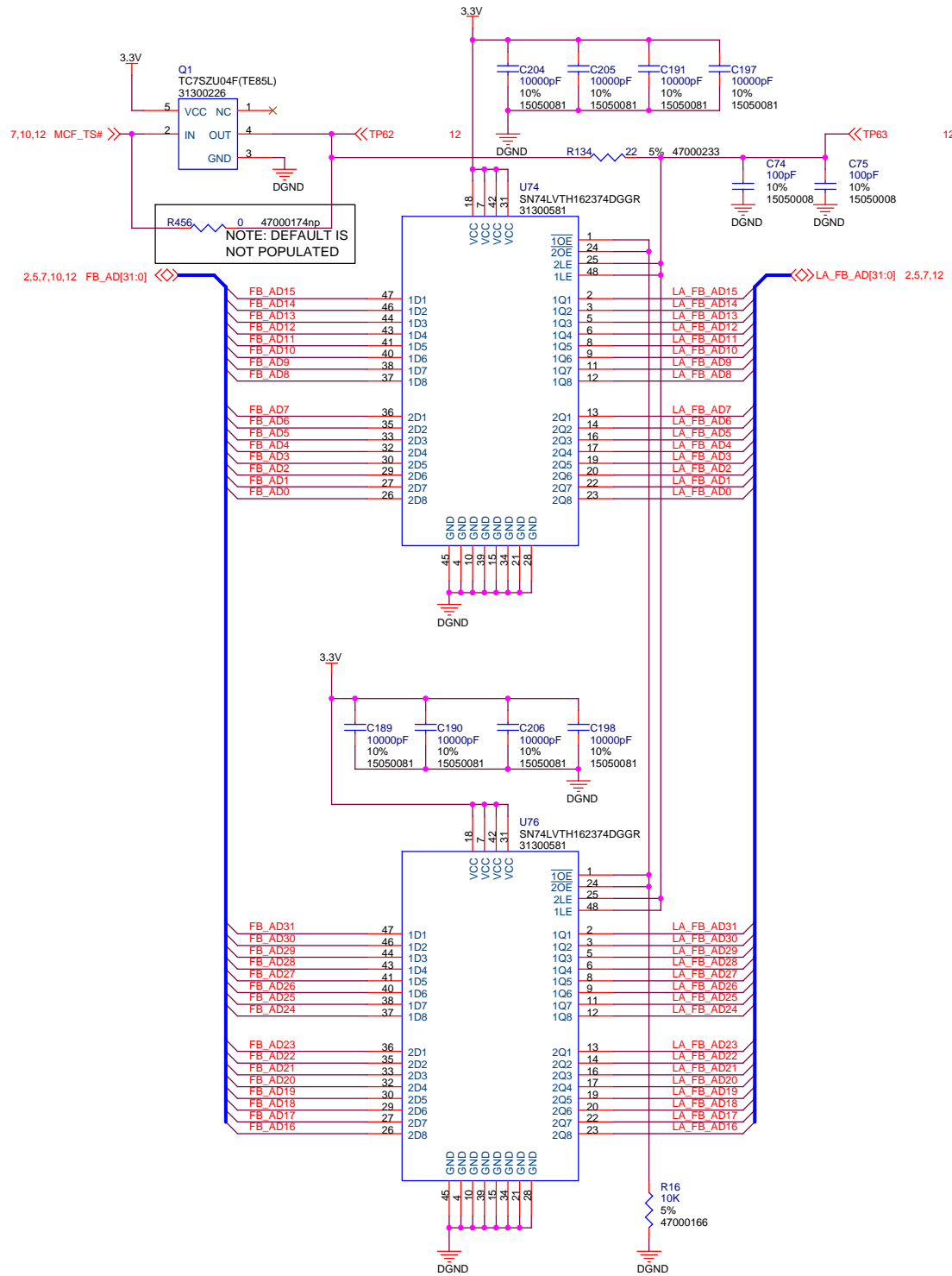


REV B -> C  
 1) CHANGED FOOTPRINT OF J1, J2, J3, AND J4 TO SUPPORT FX8C CONNECTORS.  
 2) SWAPPED SIGNAL NAMING OF CANTX0/CANRX0 WITH CANTX1/CANRX1  
 REV 201 -> 301  
 1) ADDED R2, R7, R44, R45, R46, R47, R48, R49  
 2) ADDED R220, R228, R278, R279  
 3) SHIFTED DSPI\_CS0 AND DSPI\_CS2 TO J4 PINS 11, 13. ADDED PS\_ON#, PWRBTN#, AND 5V\_SB SIGNALS, REMOVED DSPI\_CS3

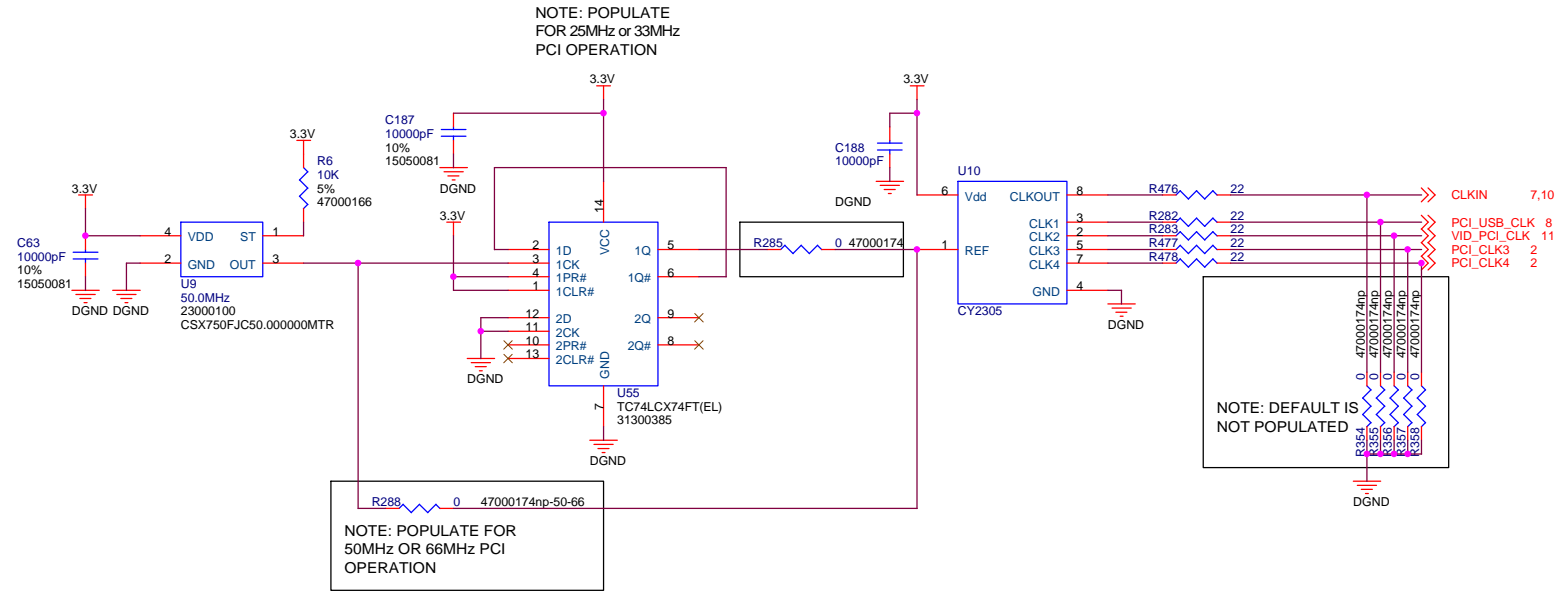
Schematic Modify Date = Tuesday, February 20, 2007

		<b>LOGIC</b> PRODUCT DEVELOPMENT		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489	
		Title ETX Fire Engine, ETX Connectors			
Size	C	Number	1004421	Rev	G
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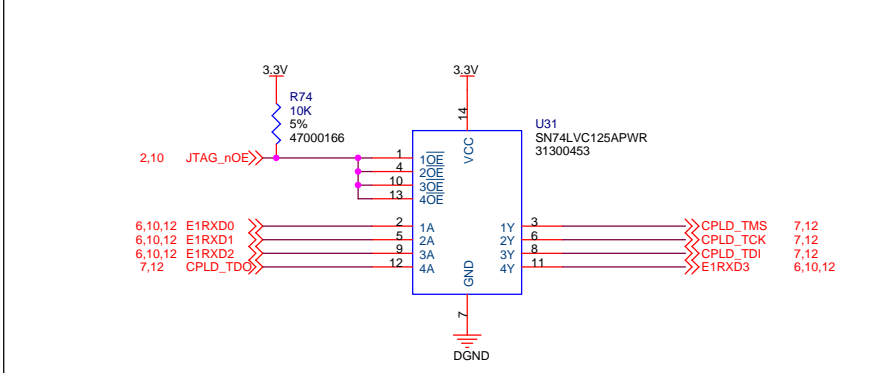
FLEXBUS ADDRESS LATCH



PCI 25/33/50/66MHz CLOCK CREATION



CPLD UPDATE BUFFER



REV F -> G  
1) REPLACED RPACK R320 WITH R476, R477, R478

REV B -> C  
1) REMOVED R363  
2) ADDED R16

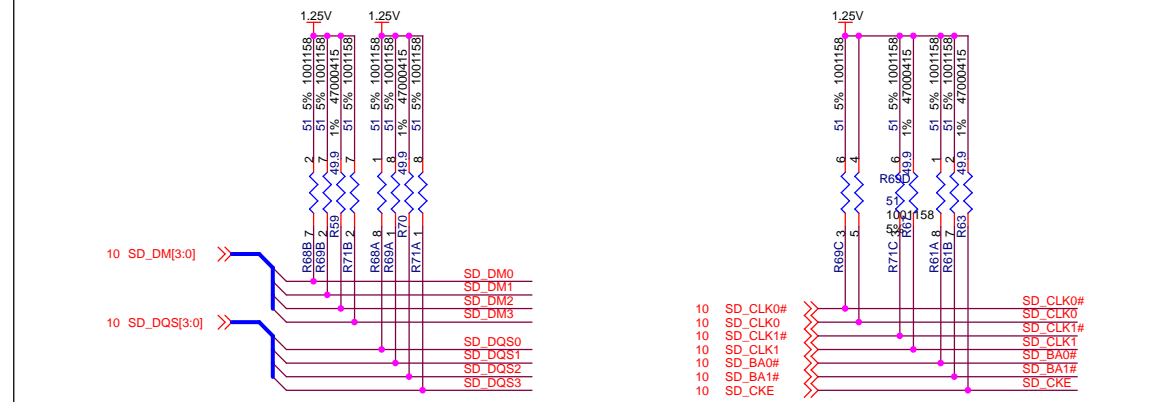
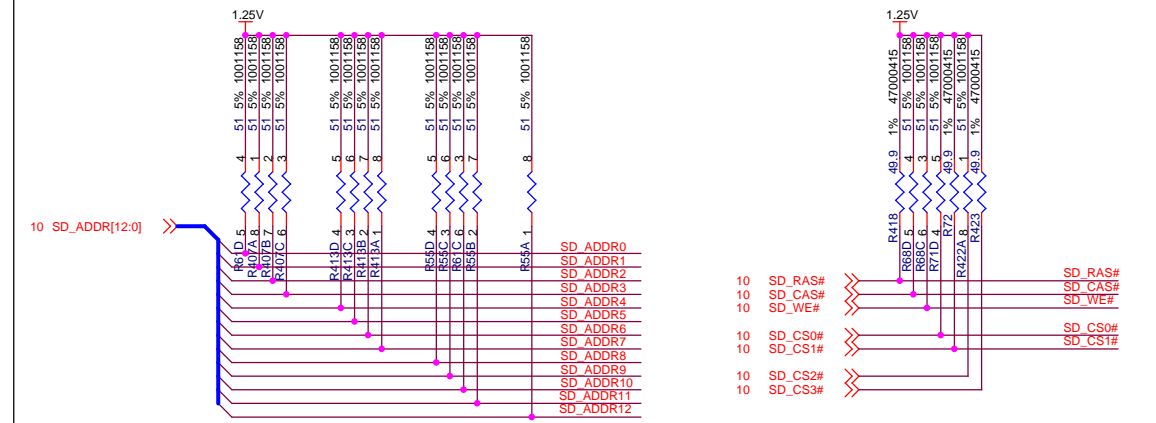
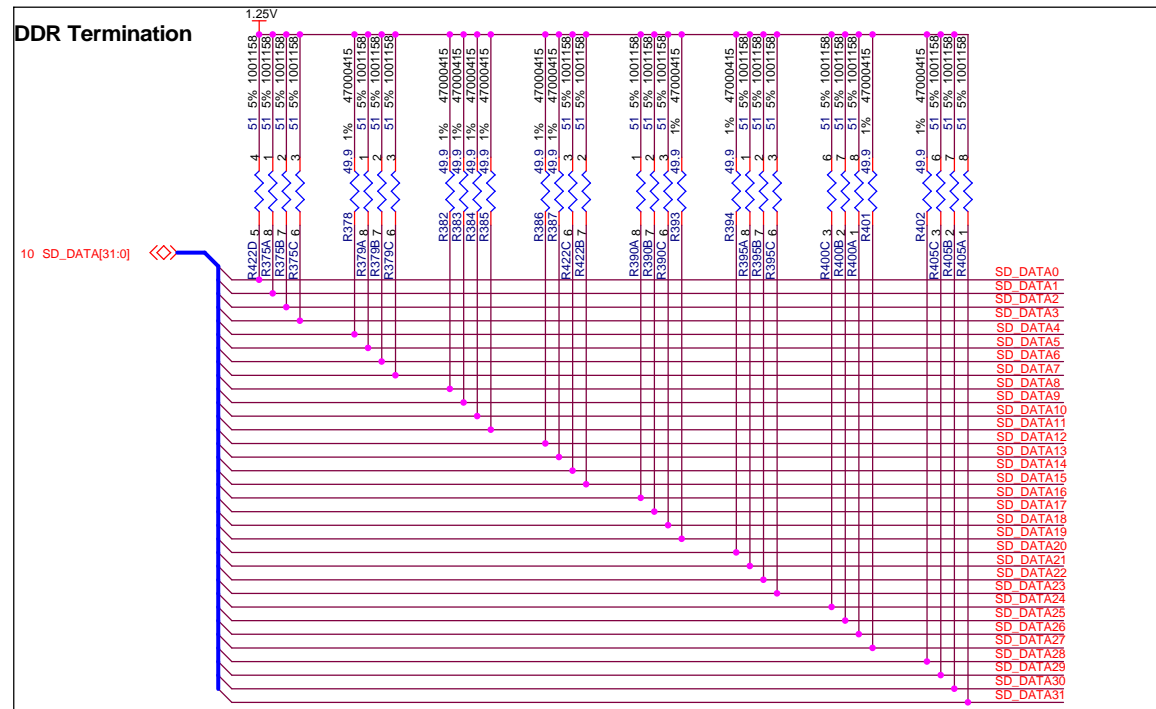
REV 301 -> A01  
1) ADDED R74 AND U31

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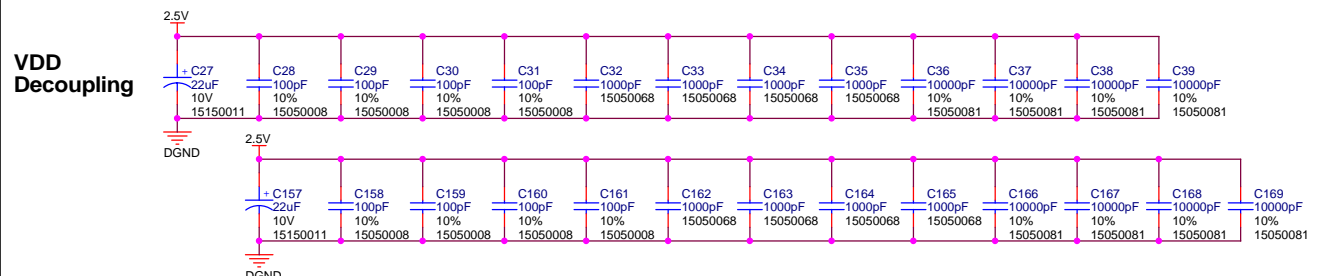
	<b>LOGIC</b> PRODUCT DEVELOPMENT	411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489
	Title ETX Fire Engine, Latches, Clocks	

Size	C	Number	1004421	Rev	G
Date	Monday, March 01, 2004	Project	MOT-ETX	Sheet	3 Of 13

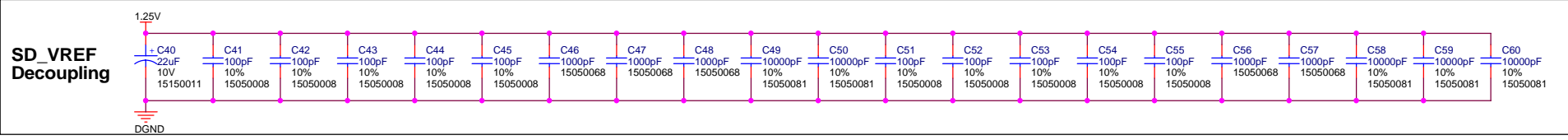
DDR Termination



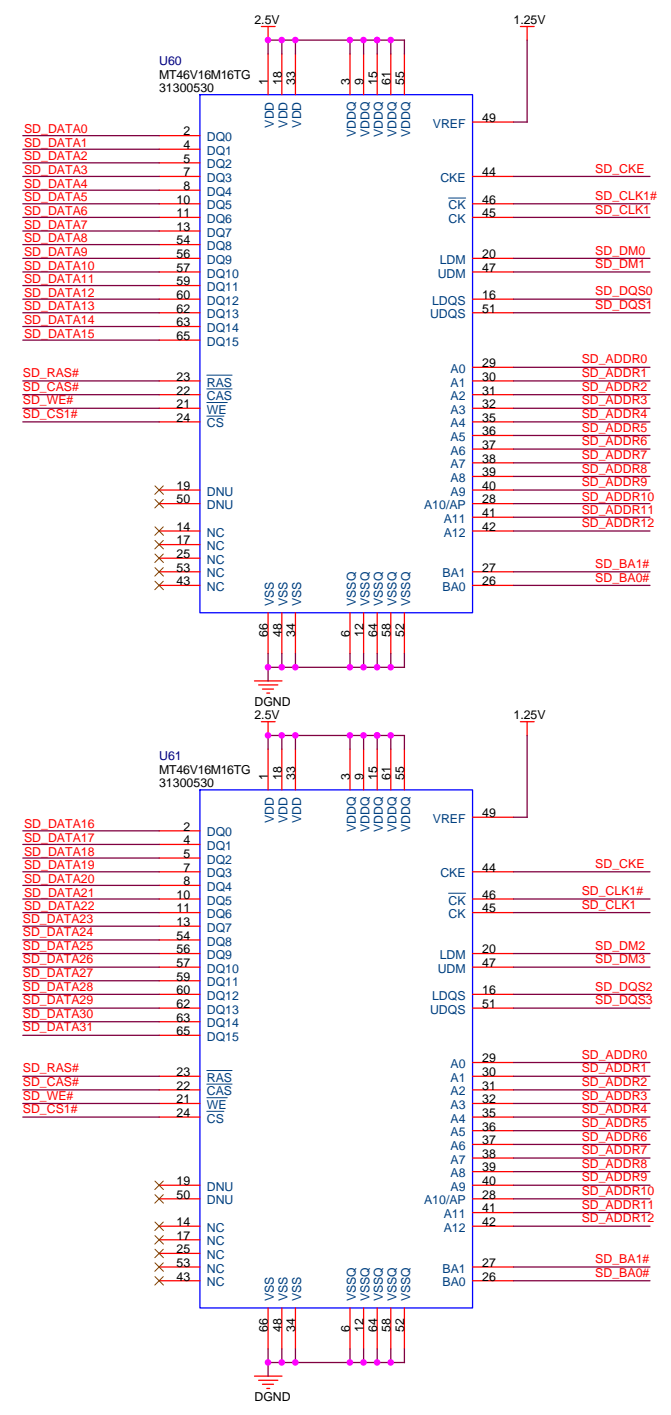
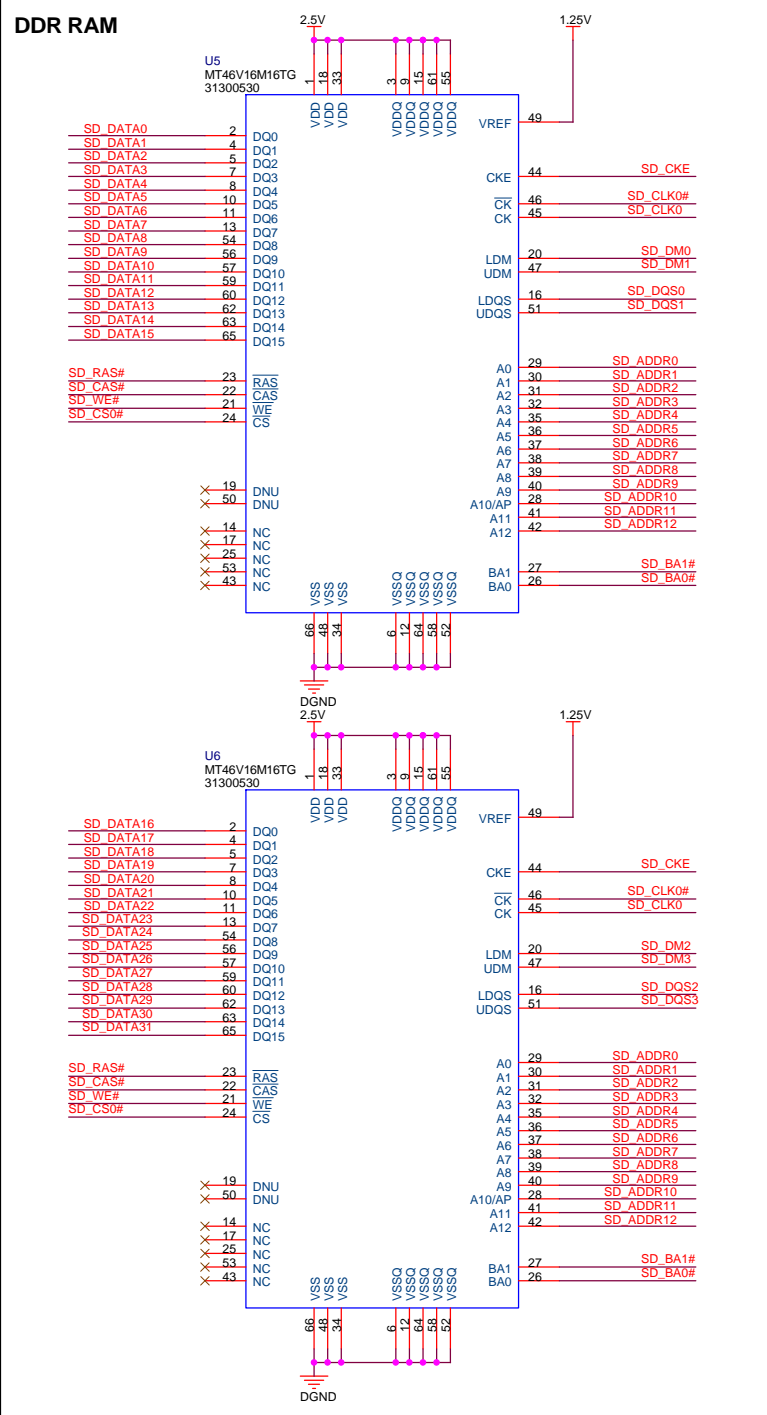
VDD Decoupling



SD\_VREF Decoupling



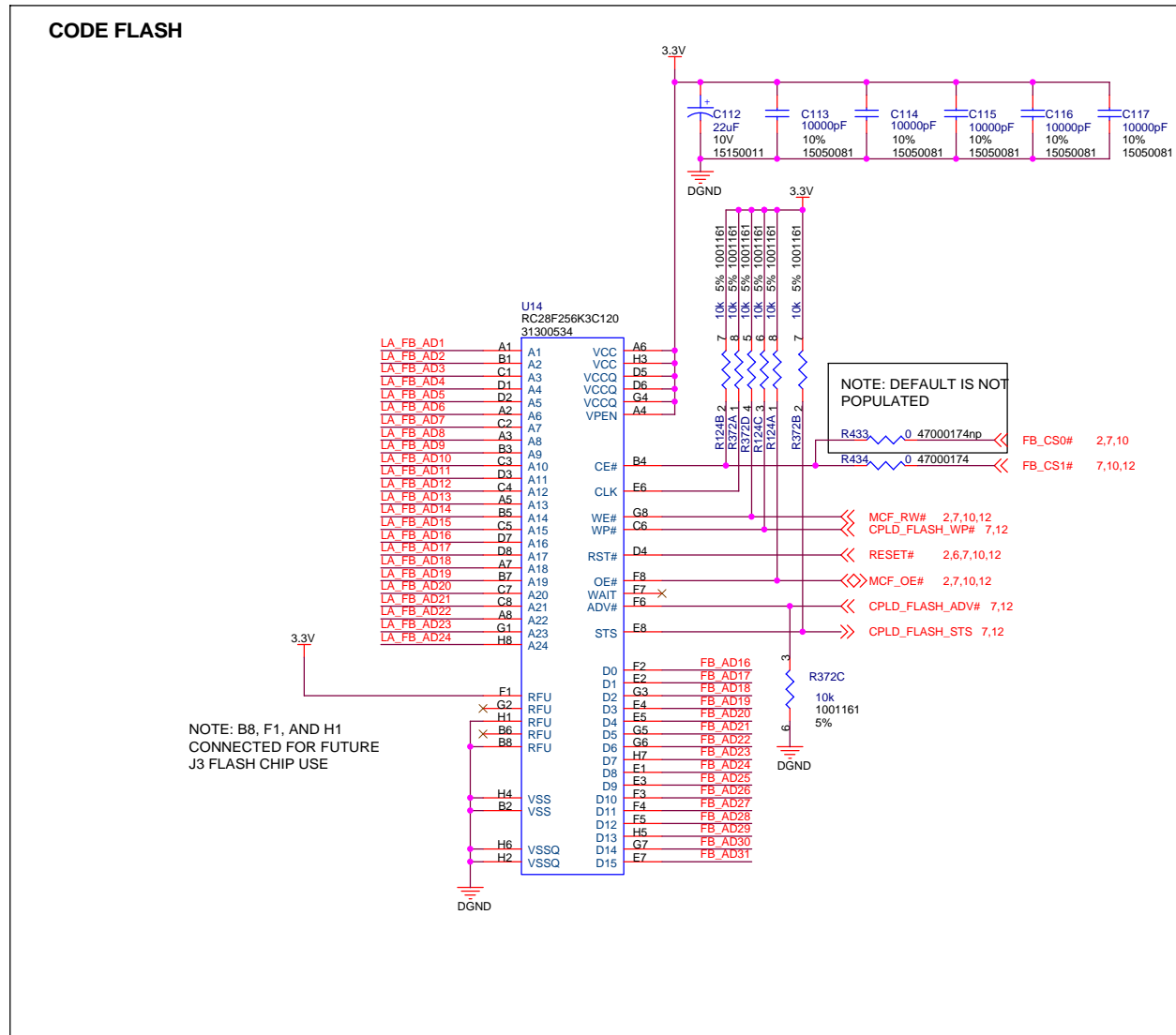
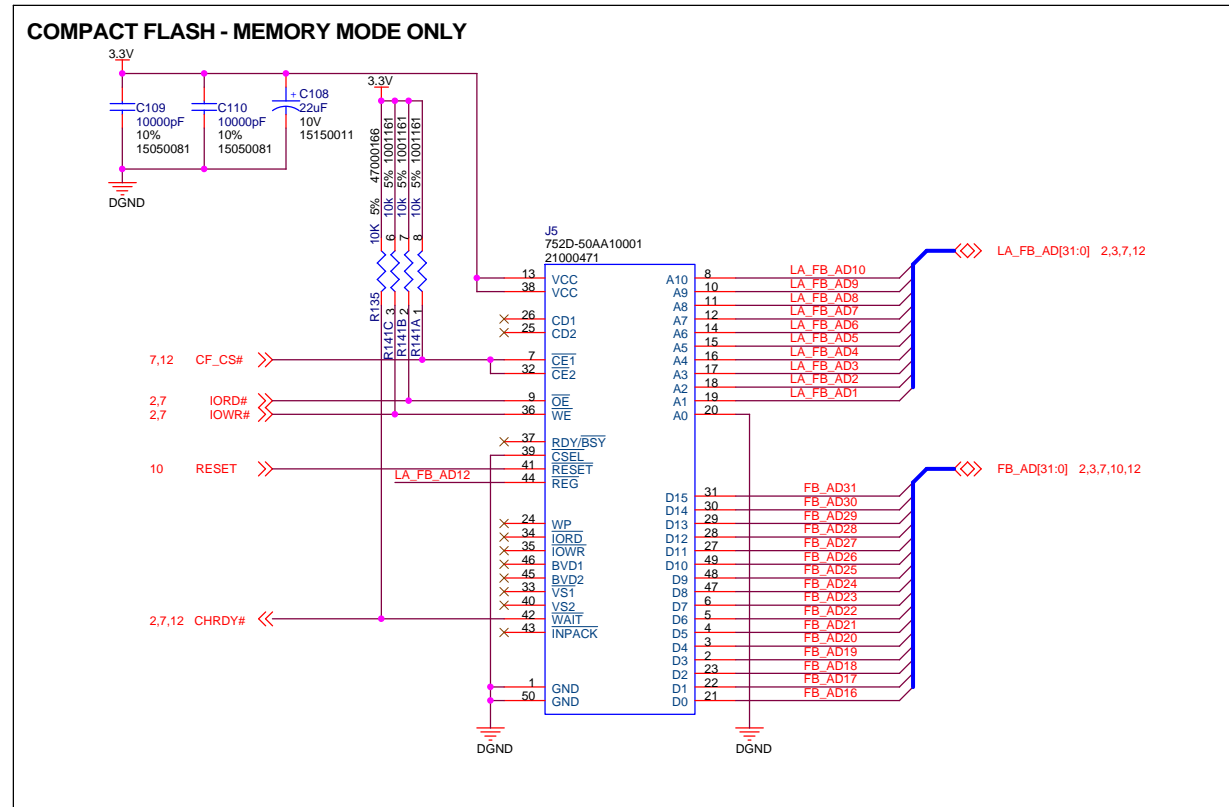
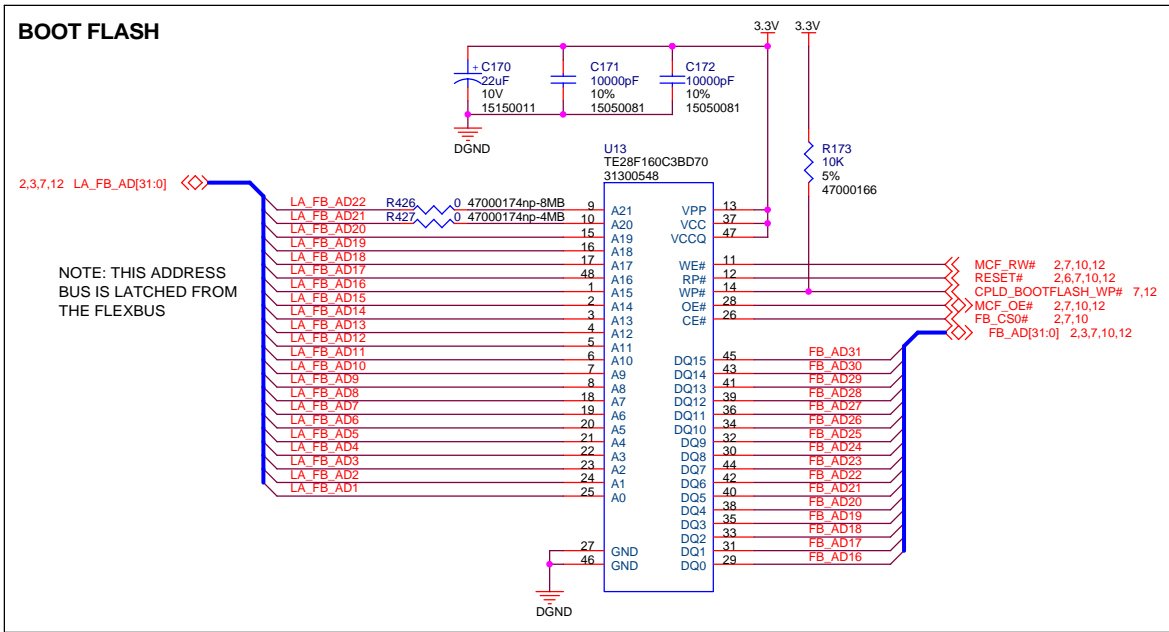
DDR RAM



04 - DDR RAM

REV 201 -> 301  
 1) REPLACED C27, C40, C157 WITH 15150011  
 Schematic Modify Date = Tuesday, February 20, 2007

		<b>LOGIC</b> PRODUCT DEVELOPMENT		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489	
		Title ETX Fire Engine DDR Memory			
Size	C	Number	1004421	Rev	G
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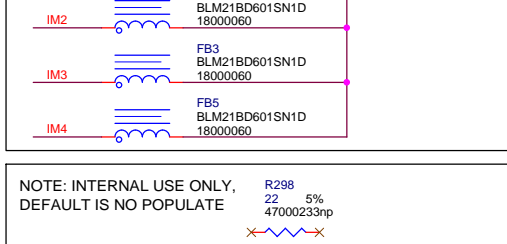
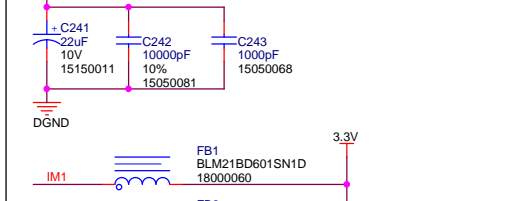
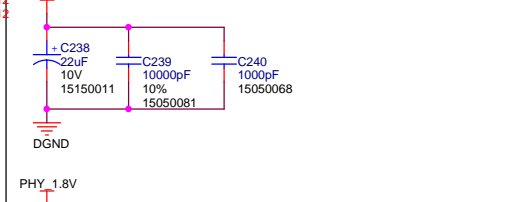
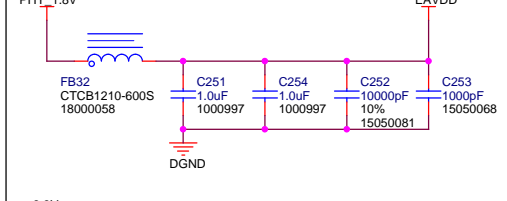
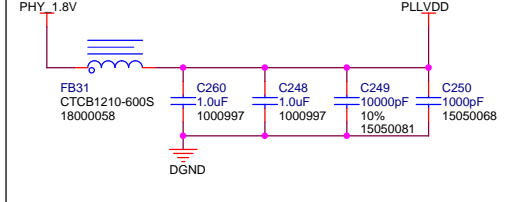
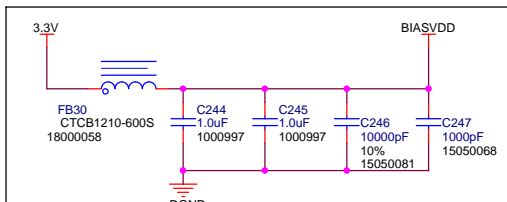
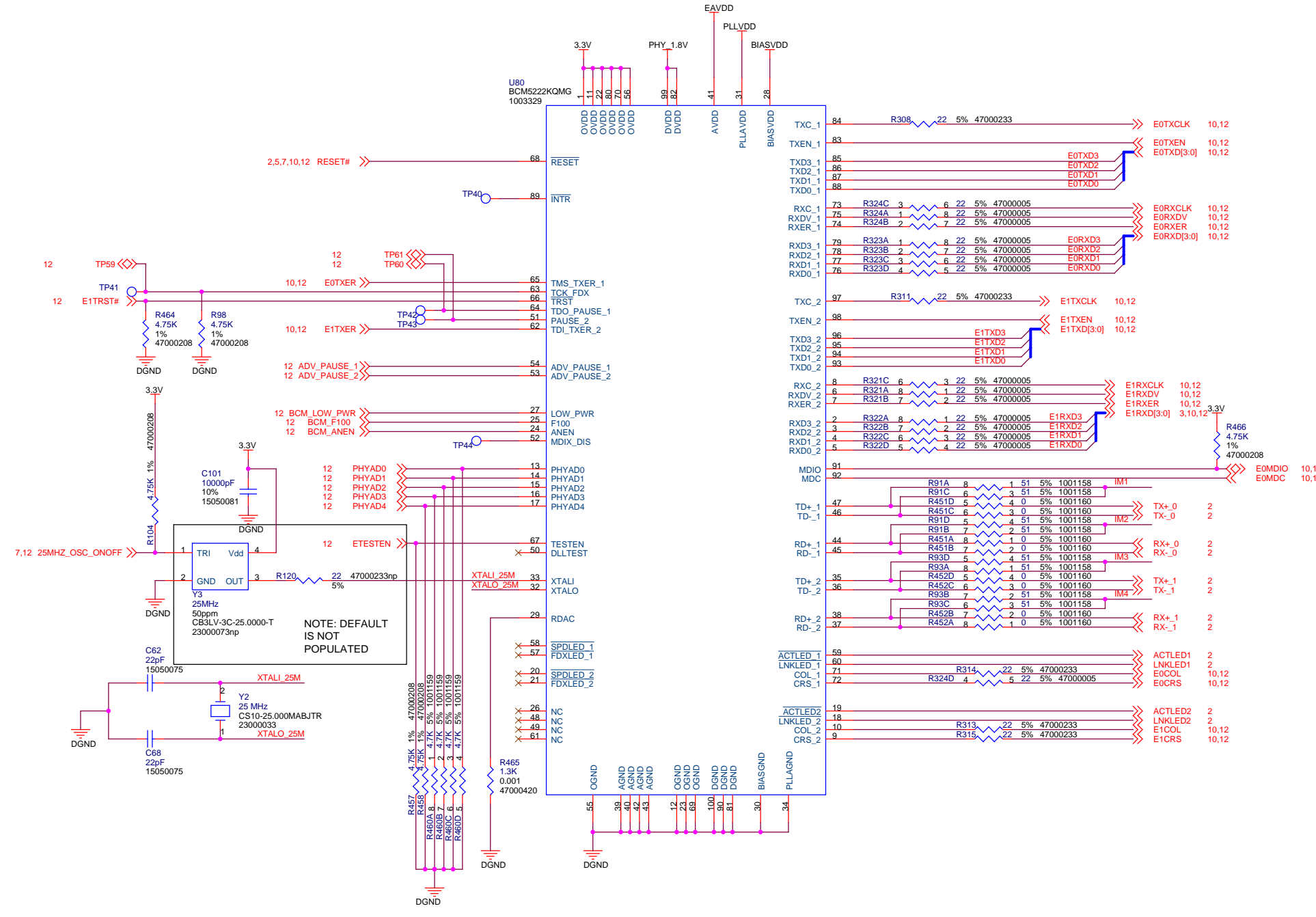
REV B -> C  
 1) CONNECTED B8, F1, AND H1 ON U14 FOR FUTURE J3 FLASH CHIP USE  
 2) ADDED R333, R334  
 3) J5 PIN 41 WAS CHANGED TO AN ACTIVE HIGH RESET SIGNAL

REV 201 -> 301  
 1) REMOVED R371  
 2) SHIFTED ADDRESS BUS DOWN BY 1 BIT ON U13  
 3) ADDED R426, R427  
 4) CHANGED R125 TO A PULLDOWN ON U14 ADV#  
 5) ADDED PULLUP R471  
 6) REPLACED C108 WITH 15150011

Schematic Modify Date = Tuesday, February 20, 2007

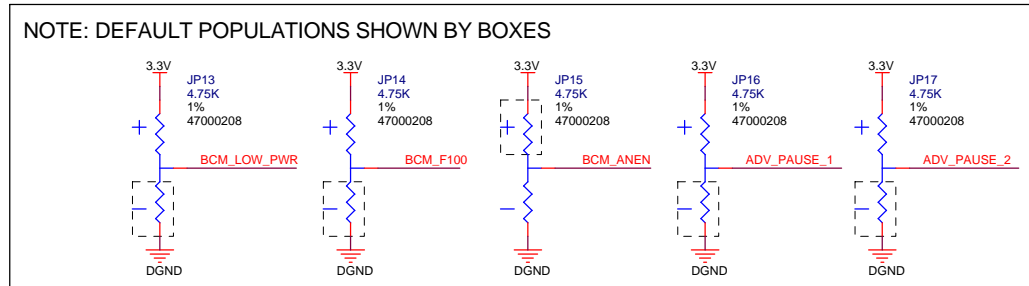
		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489			
		Title ETX Fire Engine, Boot Flash and Code Storage			
Size	C	Number	1004421	Rev	G
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NOTE: INTERNAL USE ONLY, DEFAULT IS NO POPULATE

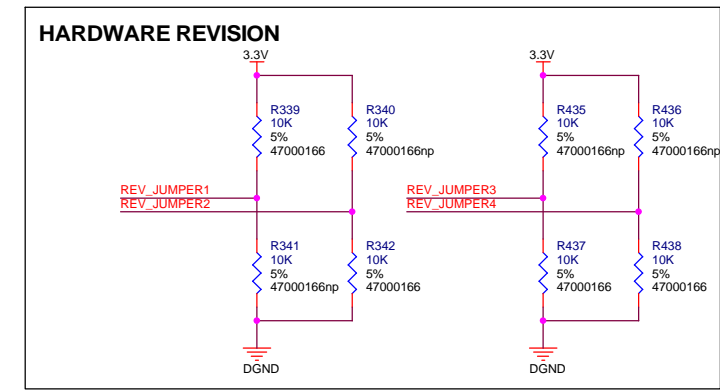
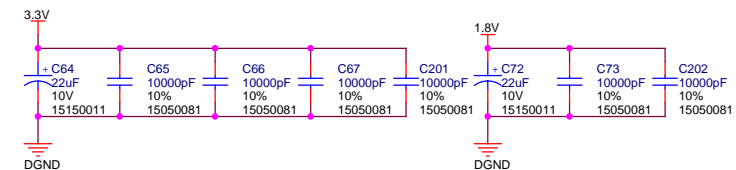
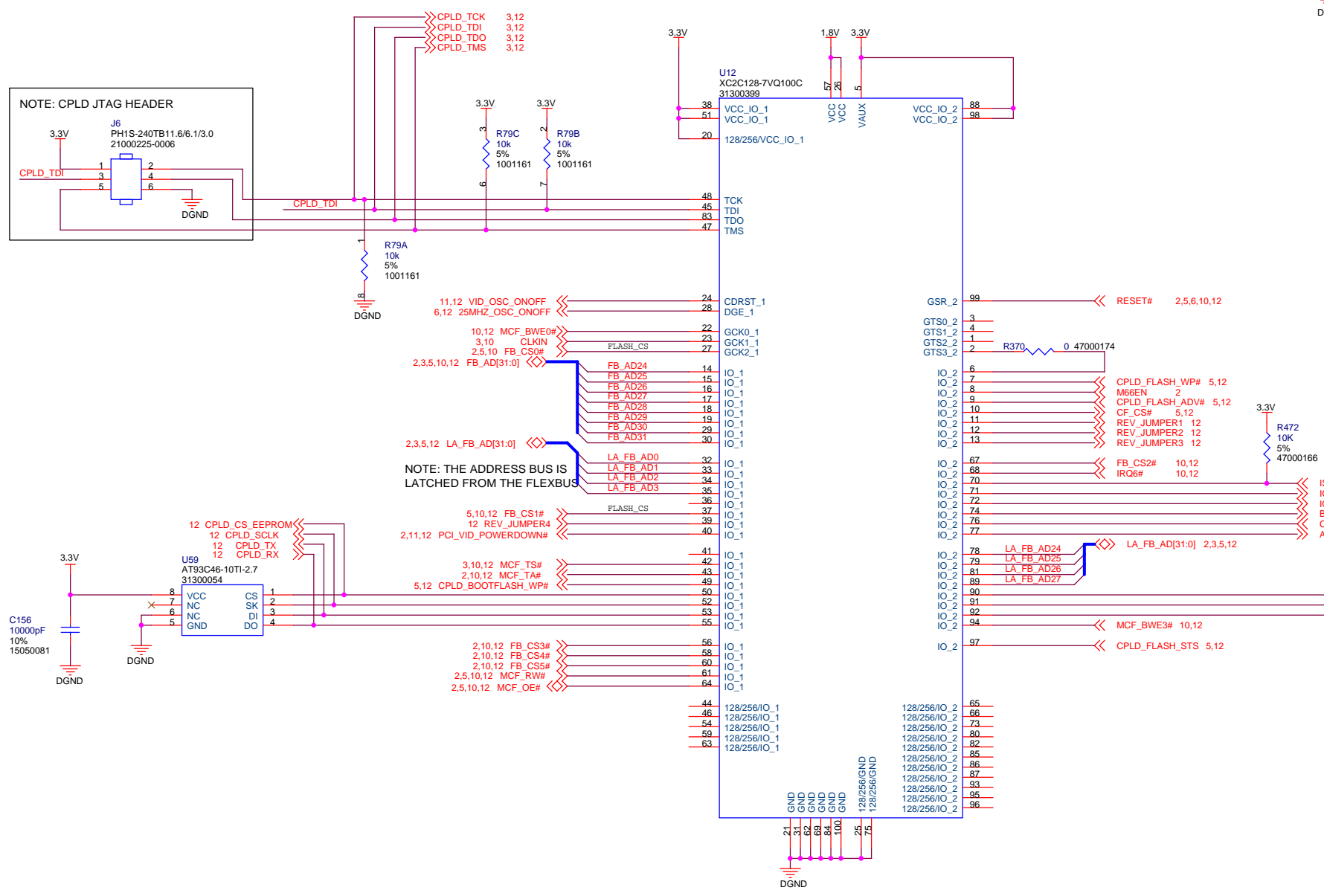
R298 22 5% 47000233np



- REV E -> F
- 1) CHANGED U94 BGA TO U80 PQFP FOR ROHS COMPLIANCE
  - 2) CHANGED RPACK NETS TO EASE ROUTING
- REV B -> C
- 1) CHANGED C244, C245, C248, C251, C254 C260 TO 1000997
- REV 201 -> 301
- 1) REPLACED U95, U96, U97, U98, U99 WITH JP13, JP14, JP15, JP16, AND JP17.
  - 2) CHANGED R464 TO A PULL DOWN
  - 3) REPLACED C238, C241 WITH 15150011
  - 4) ADDED R89, R90, R91, R92, R93, R94, R95, FB1, FB2, FB3, FB5 FOR IMPEDANCE MATCHING
  - 5) ADDED R98
  - 6) ADDED C62, C68, Y2

Schematic Modify Date = Tuesday, February 20, 2007

		<b>LOGIC</b> PRODUCT DEVELOPMENT		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489			
		Title ETX Fire Engine, Ethernet Transceiver					
Size	C	Number	1004421	Project	MOT-ETX	Rev	G
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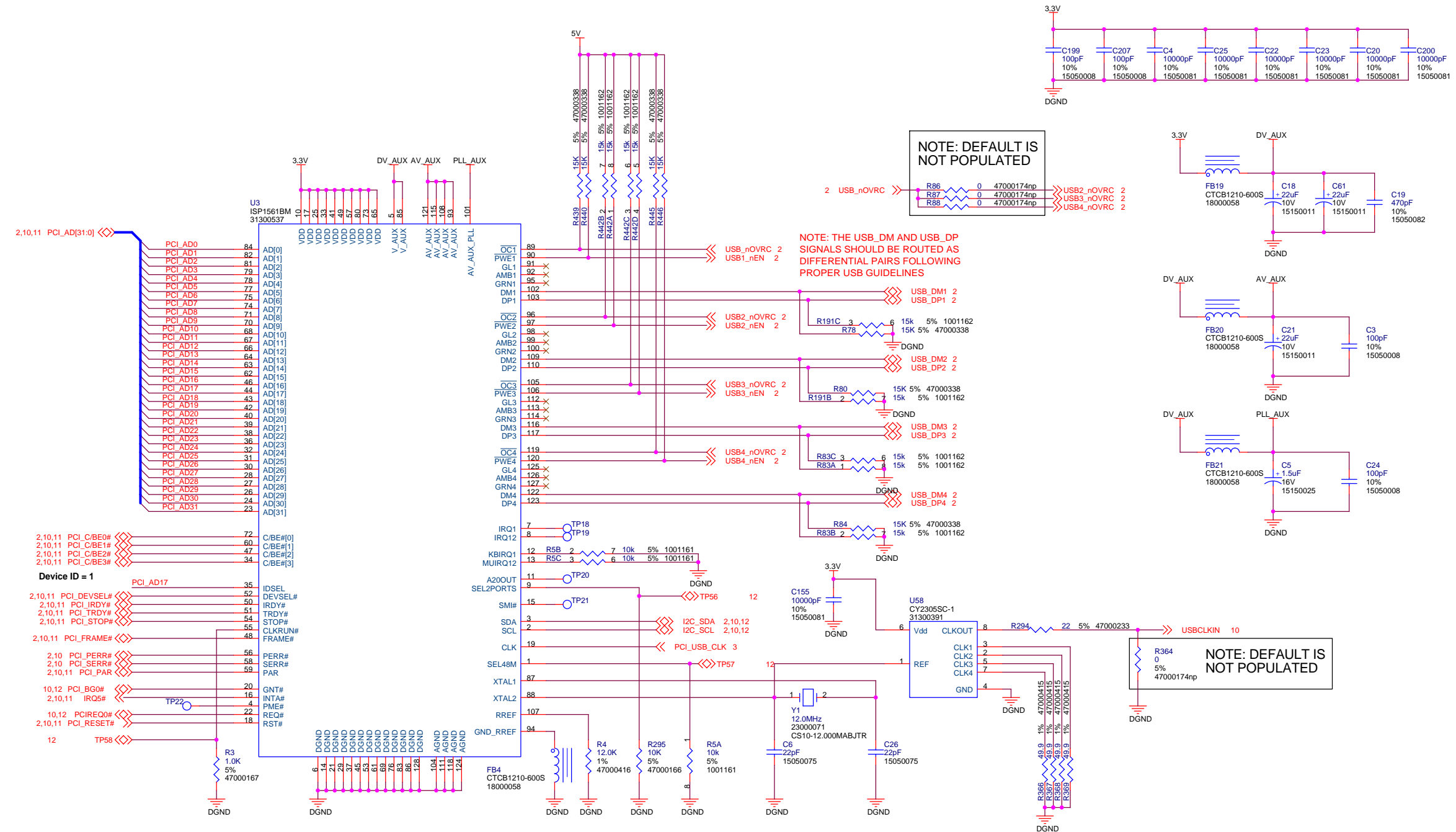


REV 201 -> 301  
 1) ADDED PULLUPS R472, R473, R474, R475

Schematic Modify Date = Tuesday, February 20, 2007

<b>LOGIC</b>		<b>LOGIC</b>		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489	
Title ETX Fire Engine, CPLD					
Size C	Number 1004421	Project MOT-ETX		Rev G	
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# 08 - USB HOST CONTROLLER



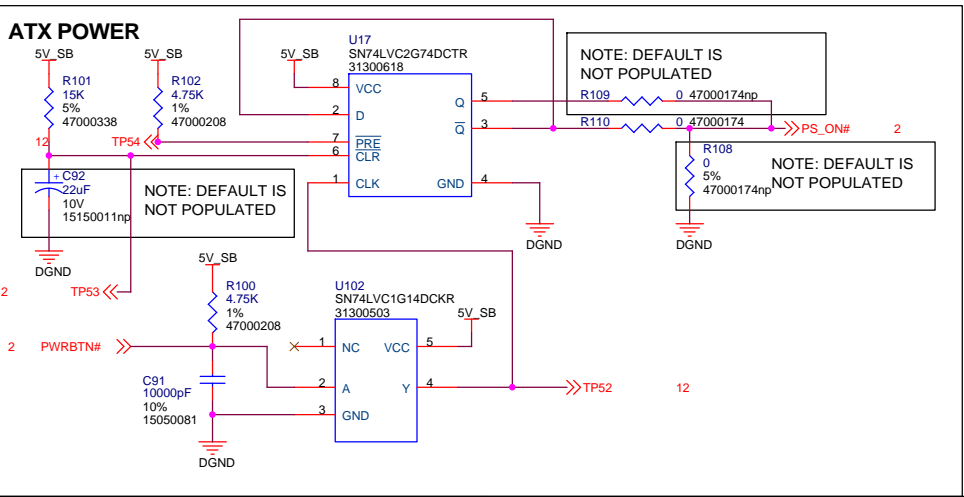
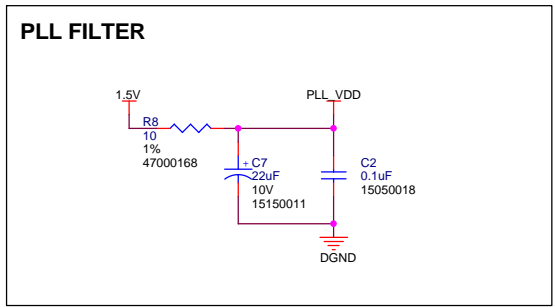
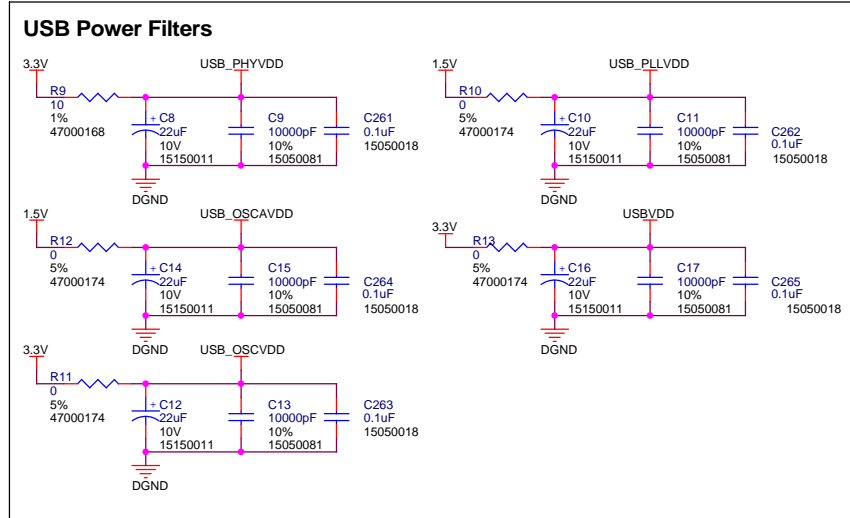
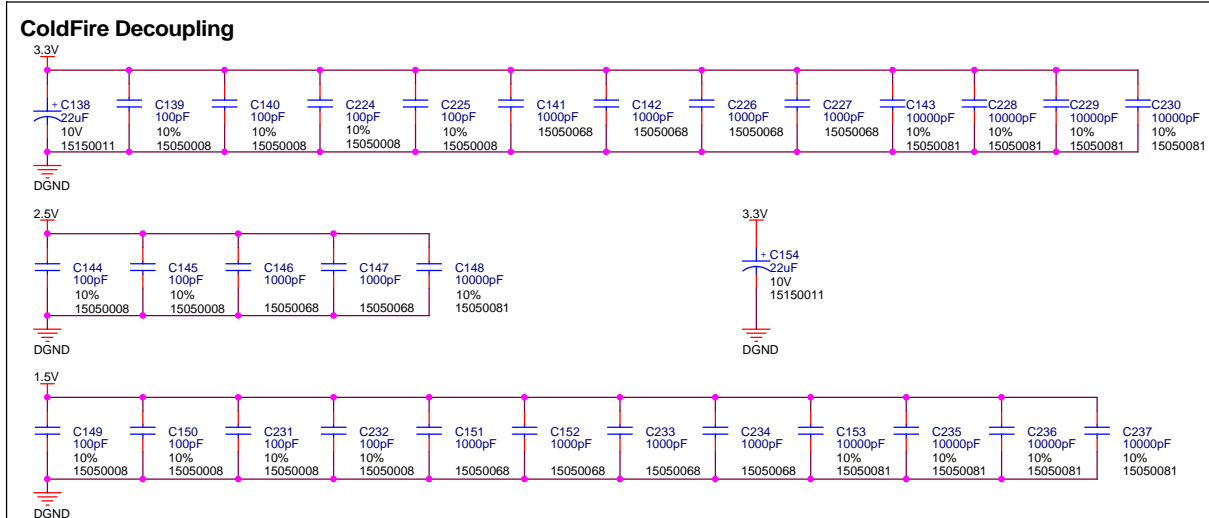
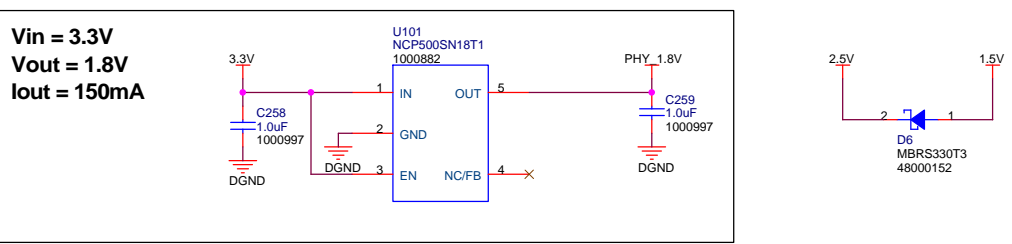
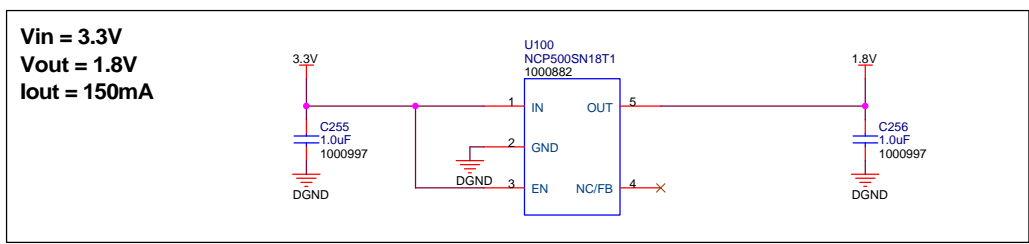
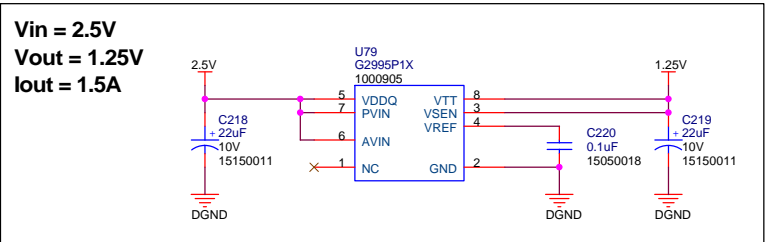
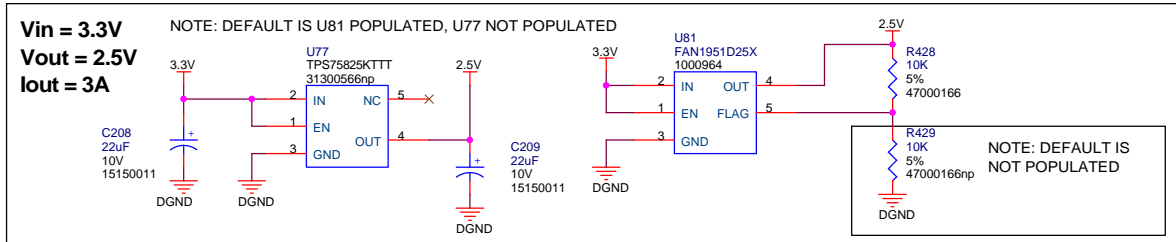
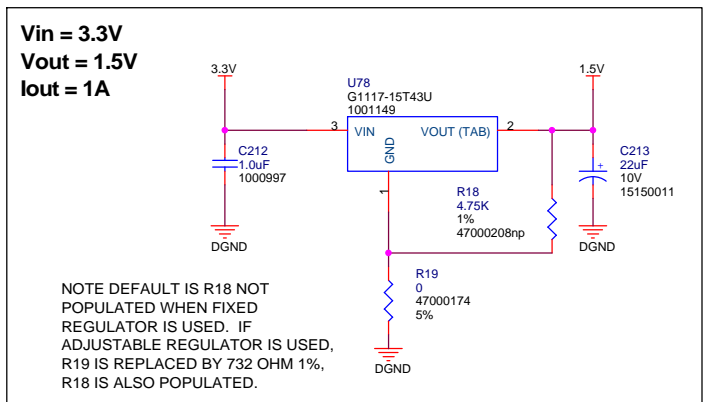
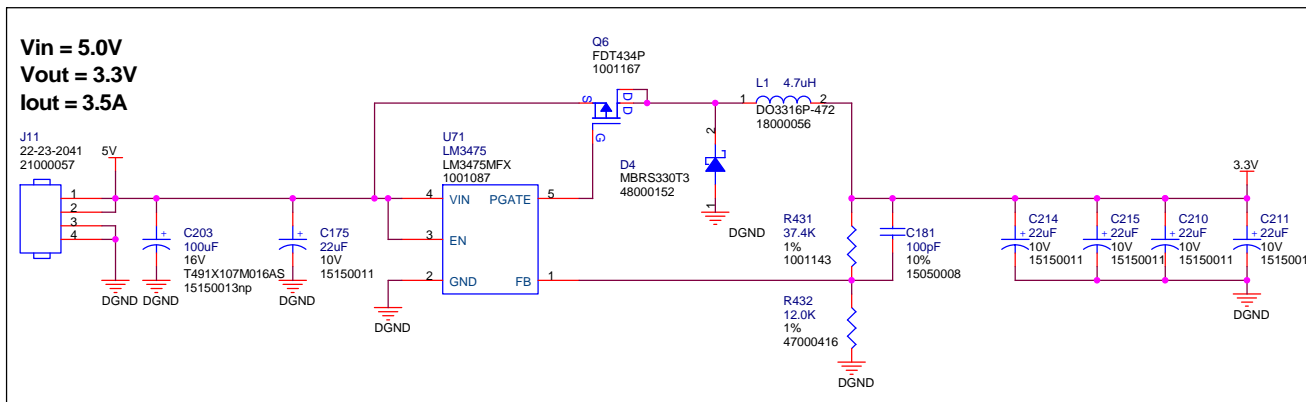
REV B -> C  
1) REMOVED R365

REV 201 -> 301  
1) ADDED PULLDOWNS R77, R78, R80, R81, R82, R83, R84, R85, R86, R87, R88  
2) RENAMED USBx\_OC TO USBx\_nOVRC, USBx\_EN TO USBx\_nEN TO INDICATE ACTIVE LEVELS  
3) REPLACED C18 WITH 15150011, ADDED C61

Schematic Modify Date = Tuesday, February 20, 2007

		<b>LOGIC</b> <b>PRODUCT DEVELOPMENT</b>		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489	
		Title ETX Fire Engine, PCI, USB Host Controller			
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- REV D -> E  
1) ADDED R18, R19  
2) CHANGED USBVDD, USB\_OSCVDD FROM 1.5V TO 3.3V SUPPLIES
- REV C -> D  
1) REMOVED TP55 TEST NET FROM 5V RAIL
- REV B -> C  
1) CHANGED C212, C216, C217, C255, C258 TO 1000997  
2) U100, U101 CHANGED TO 1000882  
3) CHANGED C256, C258 TO 1000997  
4) CHANGED U79 TO 1000905  
5) CHANGED C208, C218, C219 TO 15150011  
6) REMOVED R424, R425, C216, C217  
7) CHANGED C220 TO 15050081  
8) ADDED U81, R428, R429  
9) REMOVED R319  
10) CHANGED U71 FROM 31300044-0001 TO 1001087  
11) CHANGED C203 TO A NO POPULATE  
12) CHANGED C181 TO 15050008  
13) REMOVED D3, C173  
14) U78 CHANGED TO 1001149  
15) ADDED Q6
- REV 301 -> A01  
1) Added U102  
REV 201 -> 301  
1) U100 CHANGED TO 31300585, REMOVED C257  
2) REPLACED C210, C211 WITH 15150011, ADDED C214, C215  
3) REPLACED C138 WITH 15150011, ADDED C154  
4) REPLACED C7, C8, C10, C12, C14, C16, C256, C259 WITH 15150011  
5) REPLACED J11 WITH 21000057  
6) ADDED ATX POWER UP CIRCUITRY
- Schematic Modify Date = Tuesday, February 20, 2007

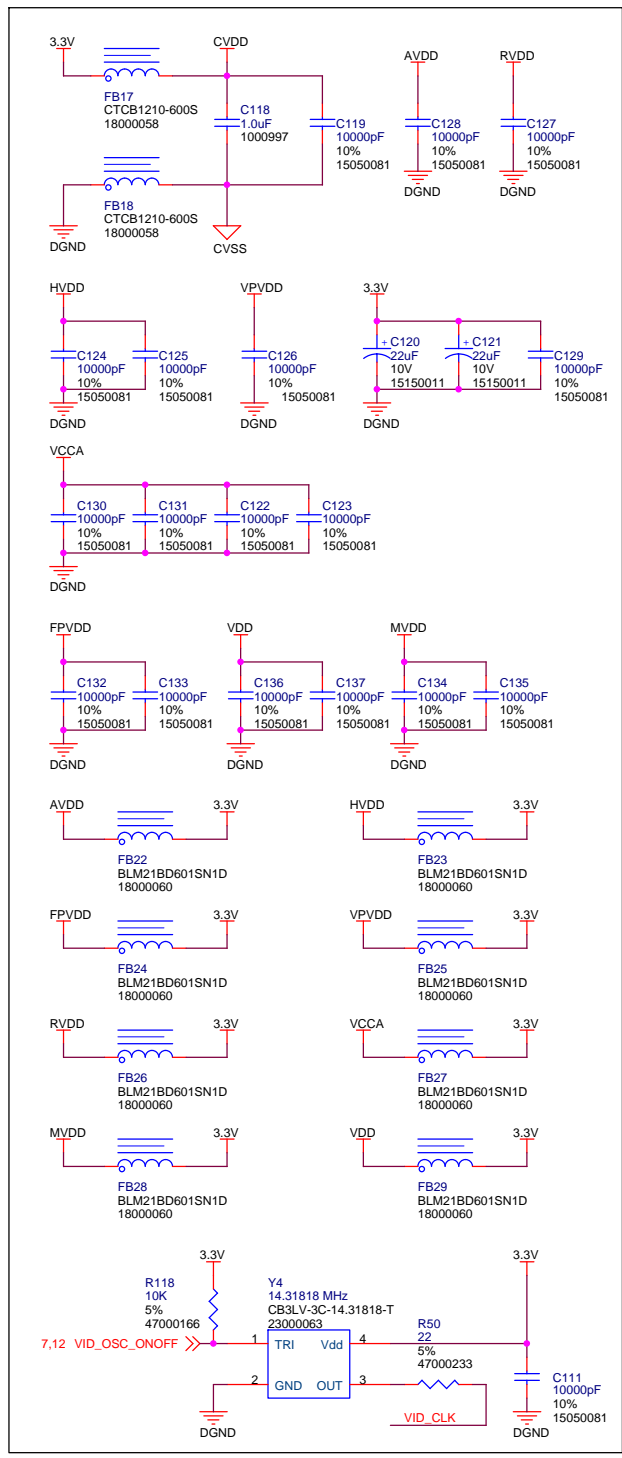
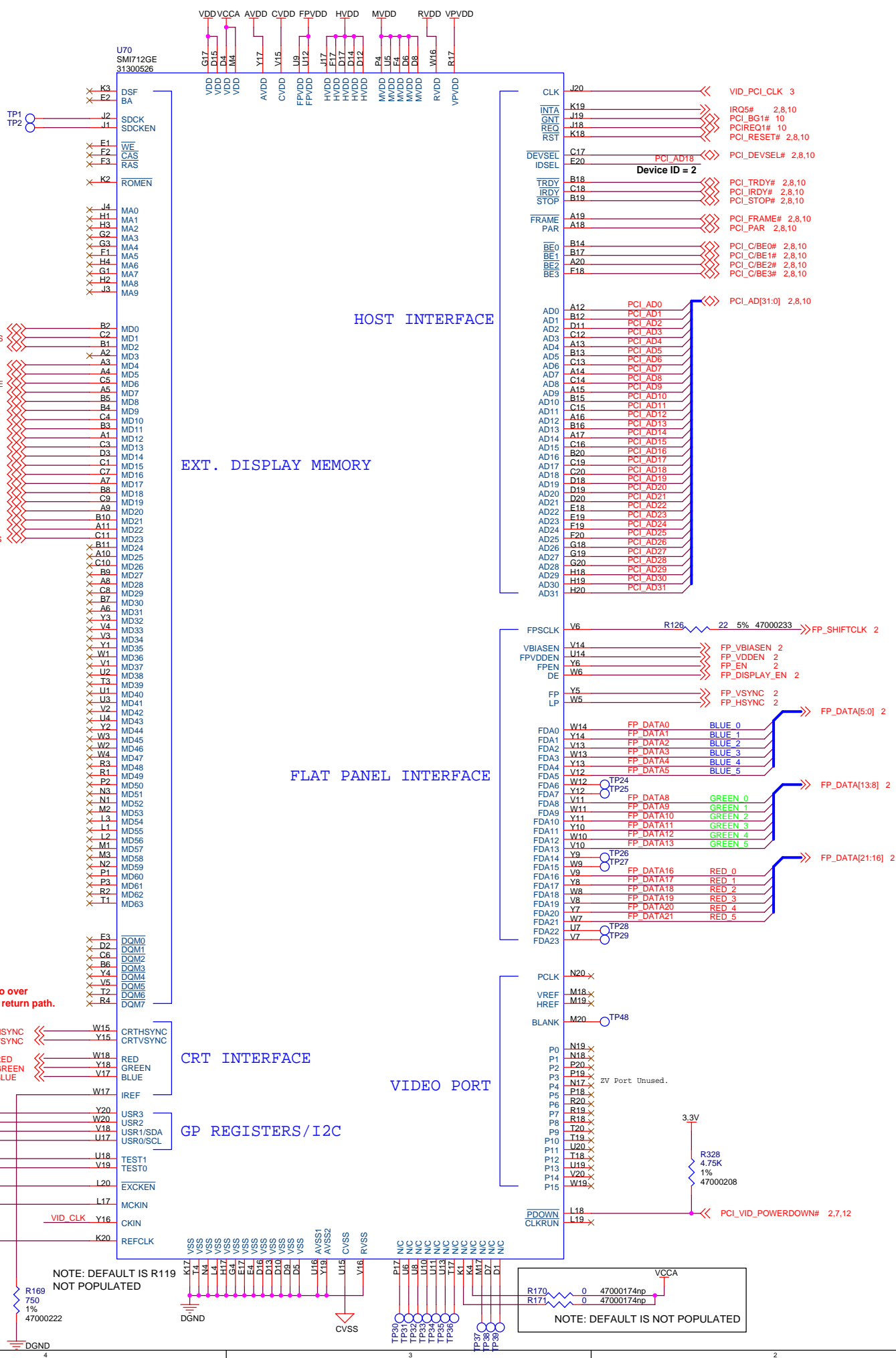


# 11 - GRAPHICS CONTROLLER

**RESET DEFAULT CONFIGURATION**  
NOTE: DEFAULT IS NO POPULATE RESISTERS IN BOXES

EXT_SGRAM_RCD	R142	1.0k	5%	47000167np
EXT_SGRAM_APDS	R143	1.0k	5%	47000167np
EXT_MEM_EN	R144	1.0k	5%	47000167np
EXT_SGRAM1	R145	1.0k	5%	47000167np
EXT_SGRAM0	R146	1.0k	5%	47000167np
MEMBUS_SIZE	R147	1.0k	5%	47000167
INT_LOGIC	R148	1.0k	5%	47000167np
LCD_TYPE	R149	1.0k	5%	47000167
TFT_FPPOL	R150	1.0k	5%	47000167
LCD_SIZE1	R151	1.0k	5%	47000167
LCD_SIZE0	R152	1.0k	5%	47000167
TFT_INTERFACE2	R153	1.0k	5%	47000167
TFT_INTERFACE1	R154	1.0k	5%	47000167np
TFT_INTERFACE0	R155	1.0k	5%	47000167
DSTN_INTERFACE	R156	1.0k	5%	47000167
USER_CONFIG3	R157	1.0k	5%	47000167np
USER_CONFIG2	R158	1.0k	5%	47000167np
USER_CONFIG1	R159	1.0k	5%	47000167np
USER_CONFIG0	R160	1.0k	5%	47000167np
EXP_ROM	R161	1.0k	5%	47000167np
EBROM	R162	1.0k	5%	47000167np
BIOS_SIZE	R163	1.0k	5%	47000167np
MEMORY_ACCESS	R164	1.0k	5%	47000167np

- 12 EXT\_SGRAM\_RCD
- 12 EXT\_SGRAM\_APDS
- 12 EXT\_MEM\_EN
- 12 EXT\_SGRAM0
- 12 EXT\_SGRAM1
- 12 MEMBUS\_SIZE
- 12 INT\_LOGIC
- 12 LCD\_SIZE0
- 12 LCD\_SIZE1
- 12 TFT\_INTERFACE0
- 12 TFT\_INTERFACE1
- 12 TFT\_INTERFACE2
- 12 DSTN\_INTERFACE
- 12 USER\_CONFIG0
- 12 USER\_CONFIG1
- 12 USER\_CONFIG2
- 12 USER\_CONFIG3
- 12 EXP\_ROM
- 12 EBROM
- 12 BIOS\_SIZE
- 12 MEMORY\_ACCESS

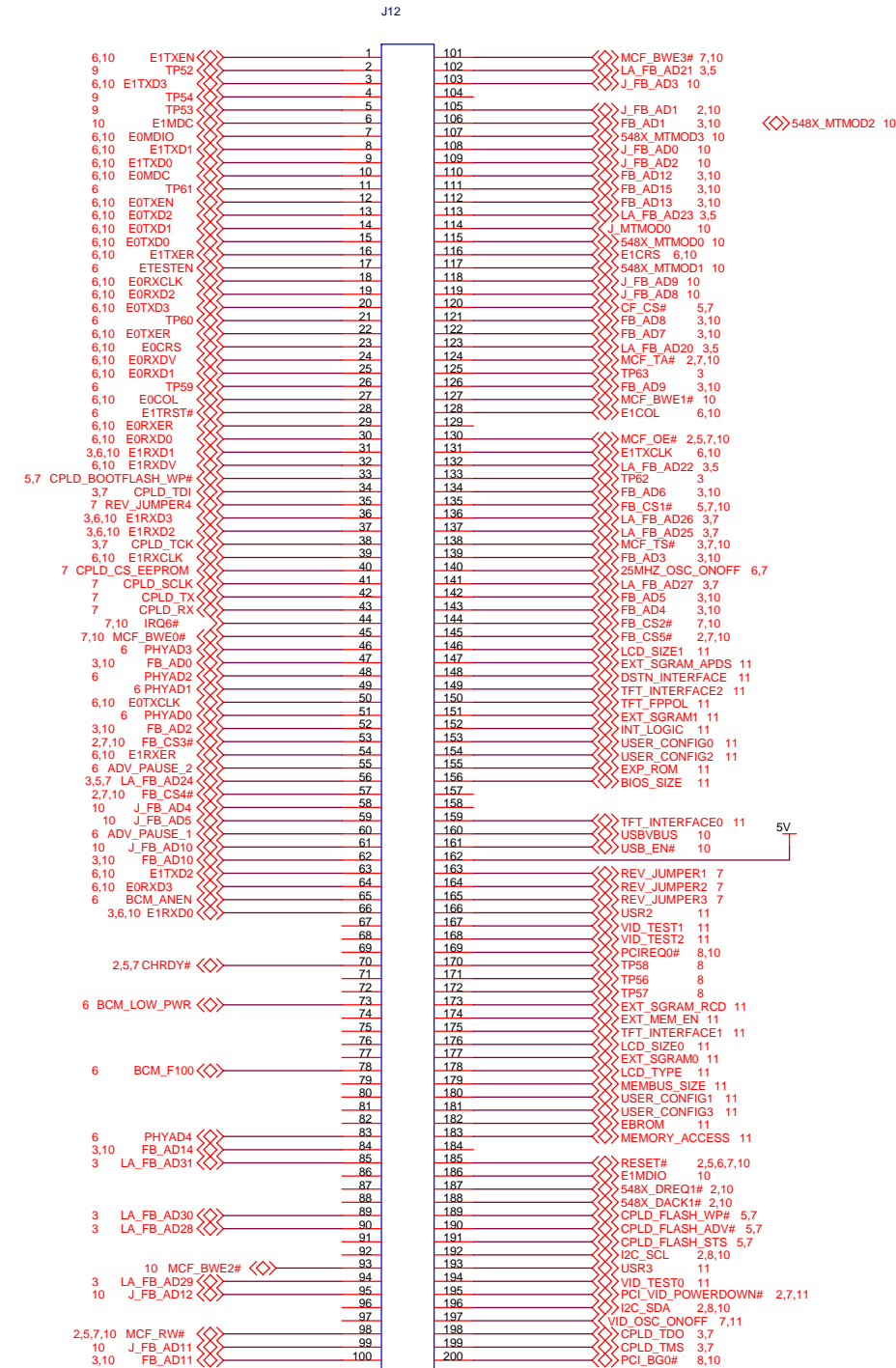


- REV B > C
- 1) CHANGED C118 TO 1000997
- REV 301 > A01
- 1) ADDED R50
- REV 201 > 301
- 1) REPLACED C120, C121 WITH 15150011
- 2) REPLACED R142 - R162, R119 WITH 1.0K 47000167
- 3) ADDED R126
- 4) CHANGED R165 TO 0 OHM 47000147

Schematic Modify Date = Tuesday, February 20, 2007

<b>LOGIC</b>		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489	
Title: ETX Fire Engine, PCI Video Controller			
Size: C	Number: 1004421	Project: MOT-ETX	Rev: G
Date: Wednesday, February 18, 2004	Project: MOT-ETX	Sheet: 11	Of: 13

ICT TEST FIXTURE PAD ISLANDS




Schematic Modify Date = Tuesday, February 20, 2007

	<b>LOGIC</b> PRODUCT DEVELOPMENT		411 WASHINGTON AVE. N MINNEAPOLIS, MN 55401 PHONE: (612) 672-9495 FAX: (612) 672-9489
	Title ETX Fire Engine, In-Circuit Test Header		
Size	C	Number 1004421	Rev G
Date	Wednesday, February 25, 2004	Project MOT-ETX	Sheet 12 Of 13

Revision Control			
ECO Number	Rev	Description of Change	Date
	101	First Revision	4/02/04
	201	Alpha Revision	4/14/04
	301	Beta Revision	5/15/04
	A01	Pilot Run	7/23/04
C00368	B	Data base conversion, no change to schematic	8/23/04
C00961	C	Power supply and other modifications	2/25/05
C01043	D	TP55 changed to 5V	3/16/05
C01635	E	USBD Power corrected, CF reset and U78 part source additions	7/20/05
C02043	F	U94 BGA changed to U80 PQFP for ROHS compliance, updated TPs and some RPACK nets. Change schematic part number to 1004421.	10/31/05
C03424	G	RPACK R320 replaced by R476, R477, R478	02/20/07

Schematic Modify Date = Tuesday, February 20, 2007

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Title ETX Fire Engine, ECO List			
Size C	Number 1004421	Rev G	
Date Friday, May 14, 2004	Project MOT-ETX	Sheet 13 Of 13	