

Cost Effective  
Network Processor  
for TCP/IP  
with ARM7TDMI™

# MLN7400 Evaluation Board Manual

Version 0.20

December 31, 2003

MCS Logic Inc.





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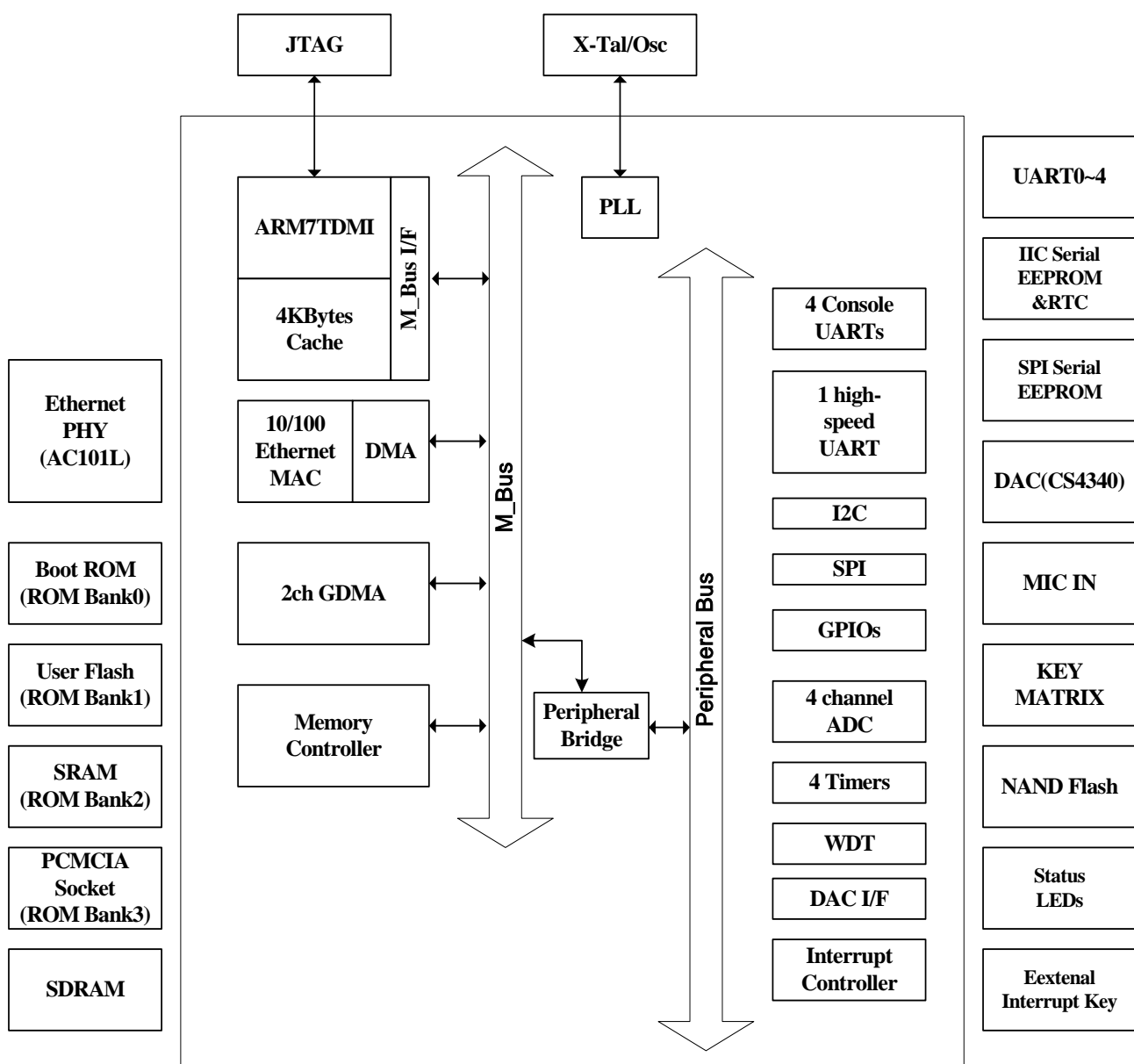
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## Chapter 1 Introduction

EVB7400 is a MLN7400 evaluation board and MCS-uClinux training kit that is suitable for code development and exploration of MN7400 with MCS-uClinux. It includes much of the hardware and software required completing your application development. It supports various function related with network, communication such as IIC, SPI, UART, 10/100 Ethernet, multimedia module such as sound DAC, storage media such as NAND FLASH memory module. Using the JTAG interface, you can debug the EVB7400 directly.

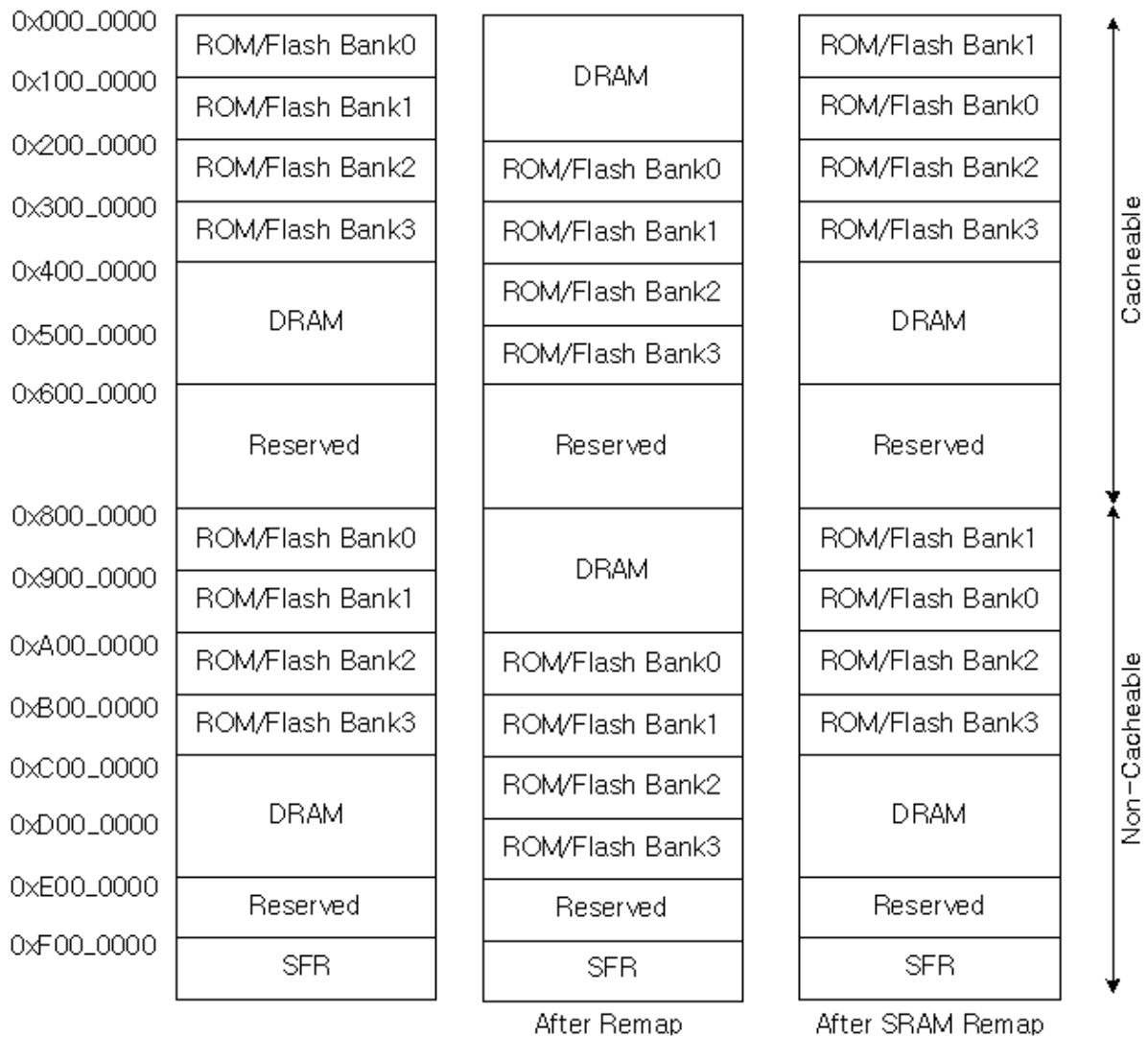
### 1.1 System Requirements

- Host computer : IBM compatible PC
- EVB7400 (Evaluation Board for MLN7400)
- DC 5V Power



[Figure 1 ] EVB7400 BLOCK DIAGRAM

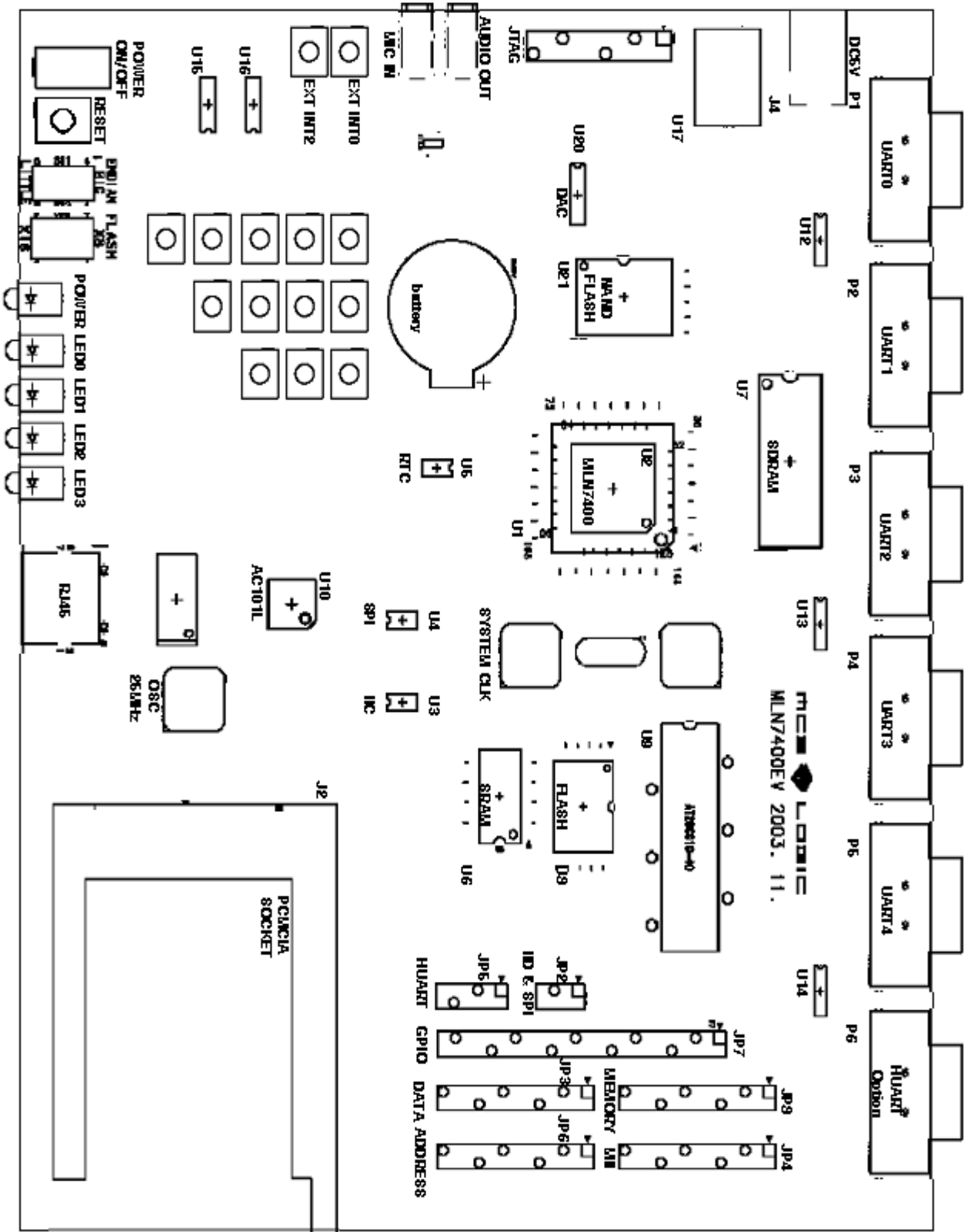
ADDRESS	MLN7400 MAP	EVB7400
0x000_0000 ~ 0x0FF_FFFF	ROM/Flash bank 0 (16Mbytes)	FLASH(512KB)
0x100_0000 ~ 0x1FF_FFFF	ROM/Flash bank 1 (16Mbytes)	SRAM(128KB)
0x200_0000 ~ 0x2FF_FFFF	ROM/Flash bank 2 (16Mbytes)	FLASH(2MB)
0x300_0000 ~ 0x3FF_FFFF	ROM/Flash bank 3 (16Mbytes)	PCMCIA Card
0x400_0000 ~ 0x5FF_FFFF	Cacheable SDRAM area (32Mbytes)	SDRAM 64Mbits(8Mbytes)
0x600_0000 ~ 0x600_5FFF (Cacheable)		
0x800_0000 ~ 0xEFF_FFFF (Non-Cacheable)		
0xF00_0000 ~ 0xFFF_FFFF	SFR Registers	



[Figure 2 ] MEMORY MAP

## 1.2 Board Components

The arrangement of major components on the board is shown in Figure 3. The major components include:



[Figure 3 ] BLOCK DIAGRAM (TOP VIEW)



### A Flash ROM

There is a socket(U9) which accept 512Kbyte size of 8 bit Flash Memory(AT29C010 ~ 40). This is for diaganostic program(includes all peripheral device driver and TCP/IP protocol stack) and BIOS(MCS-uClinux Boot loader) program.

### User Flash memory(Selectable Boot ROM)

A mounted 48 TSOP type flash(AM29LV160BB), U8, is mounted for saving MCS-uClinux image. It has 2Mbytes(1M x 16bits)size. If you want to use this for boot ROM, SW2 should be set to to X16 and U9 should be removed. (The default setting is X8)

### SDRAM

SDRAM size is 8Mbytes ( 4M x 16bits)

### SRAM

There is a SRAM at ROM Bank1. SRAM SIZE is 64K x 16 bits.

### NAND Flash

A mounted NAND Flash ROM is provided for saving user data.

To use NAND flash, you should install and uninstall some 0 ohm register at bottom of board. Please refer to chapter 2 and Schematic.

### EEPROM(AT24C256, AT25040)

There are two EEPROM(U3, U4). One is an IIC Serial EEPROM(U3) and the other is a SPI serial EEPROM(U4). The size of EEPROM(U3) is 32Kbytes, and the size of EEPROM(U4) is 4Kbytes.

### RTC & Thermometer

There is a DS1629(U5) for RTC and thermometer check. The RTC clock is supplied by the crystal(32.768KHz)

### Serial Port

There are 5 9-pin female Serial ports for serial data communiation. One is for console between the host PC and EVB7400 and others for converter(Serial to Ethernet, Serial to wireless and so on). And there is one 9-pin mail Serial ports for High Speed UART.

### Ethernet Interface

There are RJ45 connector and Ethernet Phy for network.(AC101L, 10/100 BASE-T)

### AUDIO IN/OUT

There is a stereo DAC(CS4340) for AUDIO out. And MIC and AMP is connected to ADIN3(ADC channel3) for AUDIO In.

### Reset Button

There is a button for system reset.

### Power On/Off Switch

There is a switcho for power on/off.

### LED Indicatorst

Seven LEDs are supplied on the EVB7400. Each LED shows power status, user programmable status, ethernet link and activity.

### PCMCIA Socket

There is a PCMCIA Socket(J2). To use it, you should set ROM BANK3 as PCMCIA mode.

### JTAG Port

One 20-pin JTAG port(J3) is supplied to connect with JTAG based Emulator.

### Expansion Connectors

Seven connectors(JP2~JP8) are supplied for system expansion. They contain board data bus, address bus, external memory bank control, IIC, SPI, and MII signals.

### Key Matrix

There are 12 key buttons. They can be used ADC application.

Five buttons(SW4, SW7, SW10, SW13, SW15) are connected to ADIN0(ADC channel 0).

Four buttons(SW5, SW8, SW11, SW14) are connected to ADIN1(ADC channel 1).  
Three buttons(SW5, SW8, SW11, SW14) are connected to ADIN2(ADC channel 2).

**External Interrupt Key**

There are two button to use external interrupts. Each button(S1,S2) is connected to External interrupt0 and 2.



**External Timer0 Clock**

Timer0 can be supplied by the external clock(ocsillator)



## Chapter 2 Board Configuration

The EVB7400 is set with default configuration. You can use the board with the default settings directly. However, you can also change the settings according to your needs.

### 2.1 Endian Selection (SW1)

Status	Description
BIG  LITTLE	BIG Endian
BIG  LITTLE	Little Endian

### 2.2 Boot ROM and ROM Bank0 length Selection (SW2)

Status	Description
X8  X16	ROM BANK0 Size is 8 bits. ROM BANK0 : AT29C040 512 X 8bits Flash ROM BANK2 : AM29LV160BB 1M X 16bits Flash
X8  X16	ROM BANK 0 size is 16 bits. ROM BANK0 : AM29LV160BB 1M X 16 bits Flash  *Note : AT29C040(U9) should be removed

### 2.3 NAND FLASH

You can use NAND Flash through GPIO of MLN7400. To use NAND Flash you should install 0 ohm resistance. Refer to schematic page4.

Install Register reference	Uninstall Register Reference
R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26	R39, R40, R41, R42, R43, R44, R54, R55, R56

\*Note: To use NAND Flash, you can't use SPI Interface, Console UART3 and High Speed UART(UART4)

## 2.4 GPIO Setting

<128-TQFP/ 144 -LQFP Common I/O>

<144 -LQFP Extended I/O>

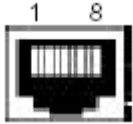
PIN	Shared	Initial	Board Setting	Setting Value	PIN	Shared	Initial	Board Setting	Setting Value
GP00	CUTXD1	N,I	UART1	S, O	GP27	EXT_TCLK0	N,I	Ext Timer0 Clk	S, I
GP01	CURXD1	N,I	UART1	S, O	GP28	EXT_TCLK1	N,I	LED 2	N, O
GP02	CUTXD2	N,I	UART2	S, O	GP29	EXT_TCLK2	N,I	LED 3	N, O
GP03	CURXD2	N,I	UART2	S, O	GP30	HUARTnDCD4	N,I	NFIO0	N, I
GP04	CUTXD3	N,I	UART3/NFWEN	S, O	GP31	HUARTnCTS4	N,I	NFIO1	N, I
GP05	CURXD3	N,I	UART3/NFWRN	S, O	GP32(0)	HUARTnRTS4	N,I	NFIO2	N, I
GP06	CUTXD4	N,I	UART4/NFALEN	S, O	GP33(1)	HUARTnDSR4	N,I	NFIO3	N, I
GP07	CURXD4	N,I	UART4/NFCLEN	S, O	GP34(2)	HUARTnDTR4	N,I	NFIO4	N, I
GP08	nBE[0]	N,I	SRAM(nBE0)	S, O	GP35(3)	EXINT2	N,I	Ext Int2 Test	S, I
GP09	nBE[1]	N,I	SRAM(nBE1)	S, O	GP36(4)	EXINT3	N,I	NFIO5	N, I
GP10	TOUT[0]	N,I	Timer0 TOUT0	S, O	GP37(5)	TOUT[2]	N,I	NFIO6	N, I
GP11	TOUT[1]	N,I	SPI SS#	N, O	GP38(6)	TOUT[3]	N,I	NFIO7	N, I
GP12	TX_ERR	S,O	LED 0	N, O	GP39(7)	DLRCK	N,I	DLRCK	S, O
GP13	NTRST	S,I	JTAG(nTRST)	S, I	GP40(8)	DBCK	N,I	DBCK	S, O
GP14	ECSN2	S,O	SRAM(ECSN2)	S, O	GP41(9)	DMCK	N,I	DMCK	S, O
GP15	ECSN3/CE1#	S,O	PCMCIA(CE1#)	S, O	GP42(10)	DDATA	N,I	DDATA	S, O
GP16	SPIMISO	N,I	SPI MISO/NFCEN	S, I					
GP17	SPIMOSI	N,I	SPI MOSI/NFRDN	S, O					
GP18	SPICLK	N,I	SPI Clock/NFRBN	S, O					
GP19	EXINT0	N,I	Ext Int0 Test	S, I					
GP20	EXINT1	N,I	PCMCIA IRQ	S, I					
GP21	EXT_UCLK	N,I	LED 1	N, O					
GP22	REG#/DLRCK	N,I	PCMCIA REG#/DLRCK	S, O					
GP23	CE2#/DBCK	S,O	PCMCIA CE2#/DBCK	S, O					
GP24	IORD#/DMCK	N,I	PCMCIA IORD#/DMCK	S, O					
GP25	IOWR#/DDATA	N,I	PCMCIA IOWR#/DDATA	S, O	1) GP22 ~GP25	7400P		PCMCIA	DAC
GP26	ENWAIT	N,I	PCMCIA ENWAIT	S, O					

S : Special  
 N : Noraml  
 I : Input  
 O : Output

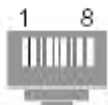
## Chapter 3 Setup EVB7400 Environments

### 3.1 Ethernet 10/100 BASE-T Connector

Same connector and pin for both 10Base-T and 100 Base-Tx



< At the network interface card/hubs >



< At the cables >

RJ45 female connector at the network interface cards and hubs

RJ45 male connector at the cable

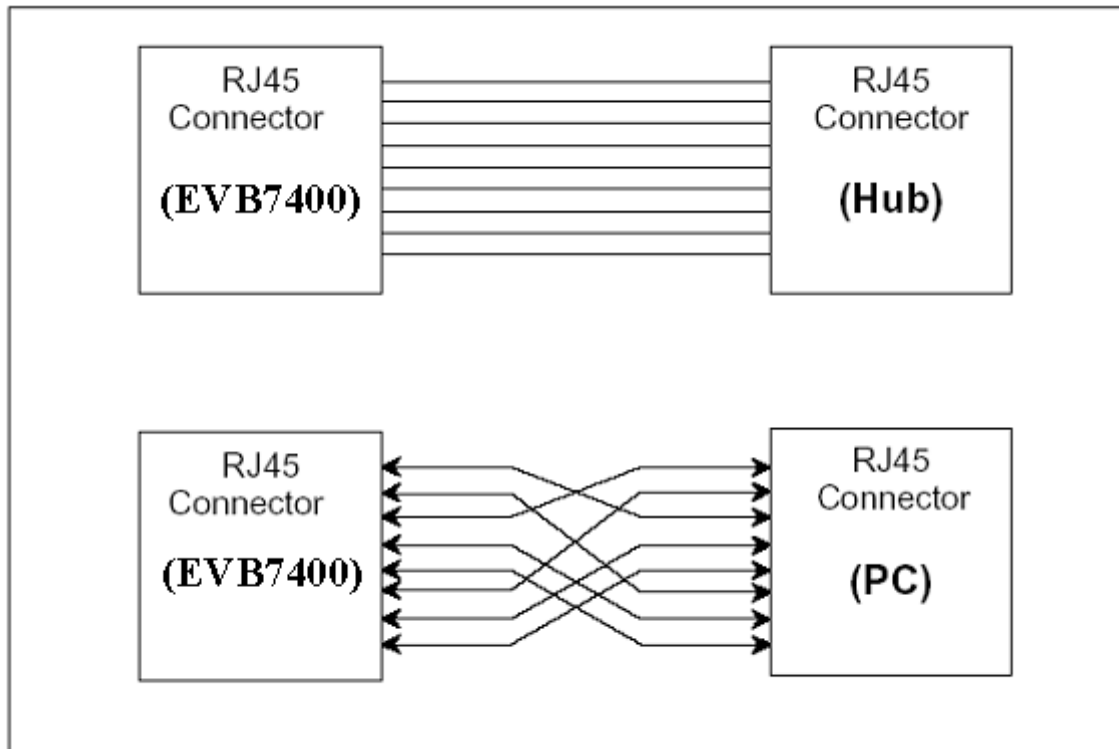
Pin	Name	Descriptions
1	TX+	Tranmit Data+
2	TX-	Tranmit Data-
3	RX+	Receive Data+
4	N/C	Not Connected
5	N/C	Not Connected
6	RX-	Receive Data-
7	N/C	Not Connected
8	N/C	Not Connected

NOTE : TX & RX are swapped on hub

### 3.2 Connection Method for UTP Cable

RJ45 pins on EVB7400 is defined to Adapter side. So, you straight connect EVB7400 to hub through UTP cable. In this case, between the EVB7400 and the Hub, the pin numbers correspond to each other.

Between the EVB7400 and the NIC which is on the Host PC, you have to connect each other through UTP cable which is crossover patch cord.



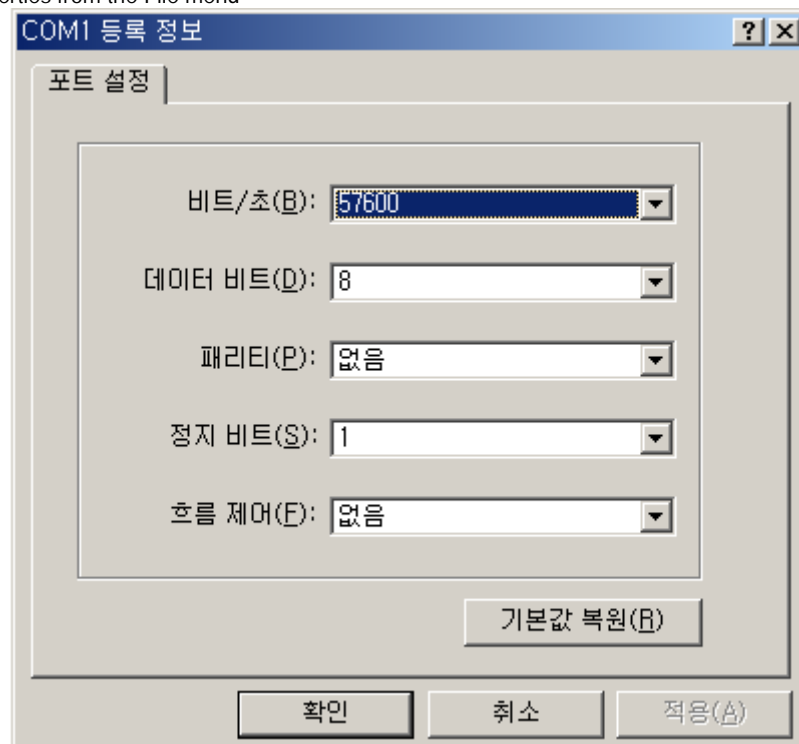
[Figure 4 ] UTP CABLE CONNECTION

## Chapter 4 Connection Configurations for Debug Console

### 4.1 Configuration the Hyper Terminal

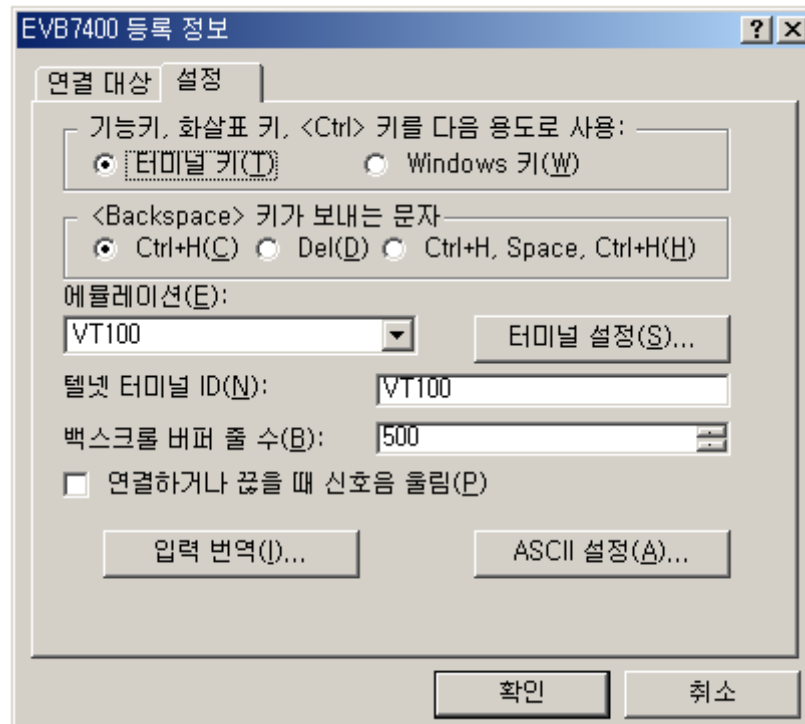
To configure the Hyper Terminal, which is a Windows utility program for serial communications, refer to following steps:

1. Run the Hyper Terminal program
  - . Window 95/98/2000/XP start tool bar -> Program -> Accessories -> Hyper Terminal Group
  - > Double click Hyperterm.exe -> Enter a connection name -> Select a icon -> Click OK.
2. Select COM Port to communicate with EVB7400 board.
  - . Choose COM1 or COM2 as the serial communication port and click OK.
3. Set the serial port properties
  - . Bits per second: 57600 bps
  - . Data Bits : 8 bits
  - . Stop Bits : 1
  - . Flow control : None
4. Select the Properties from the File menu



[Figure 5 ] PROPERTIES SETTING PAGE

5. Choose Setting Page.



[Figure 6] CHOOSE SETTING PAGE

6. Re-connect Hyper Terminal to run at new properties  
Disconnect : Call -> Disconnect  
Connect: Call -> Call
7. Power-On Reset or push the reset button on EVB7400 board  
Now, the diagnostic program menu is showed on the Hyper Terminal

## 4.2 Downloading Binary Image and Flash Write

### 4.2.1 Downloading Binary Image

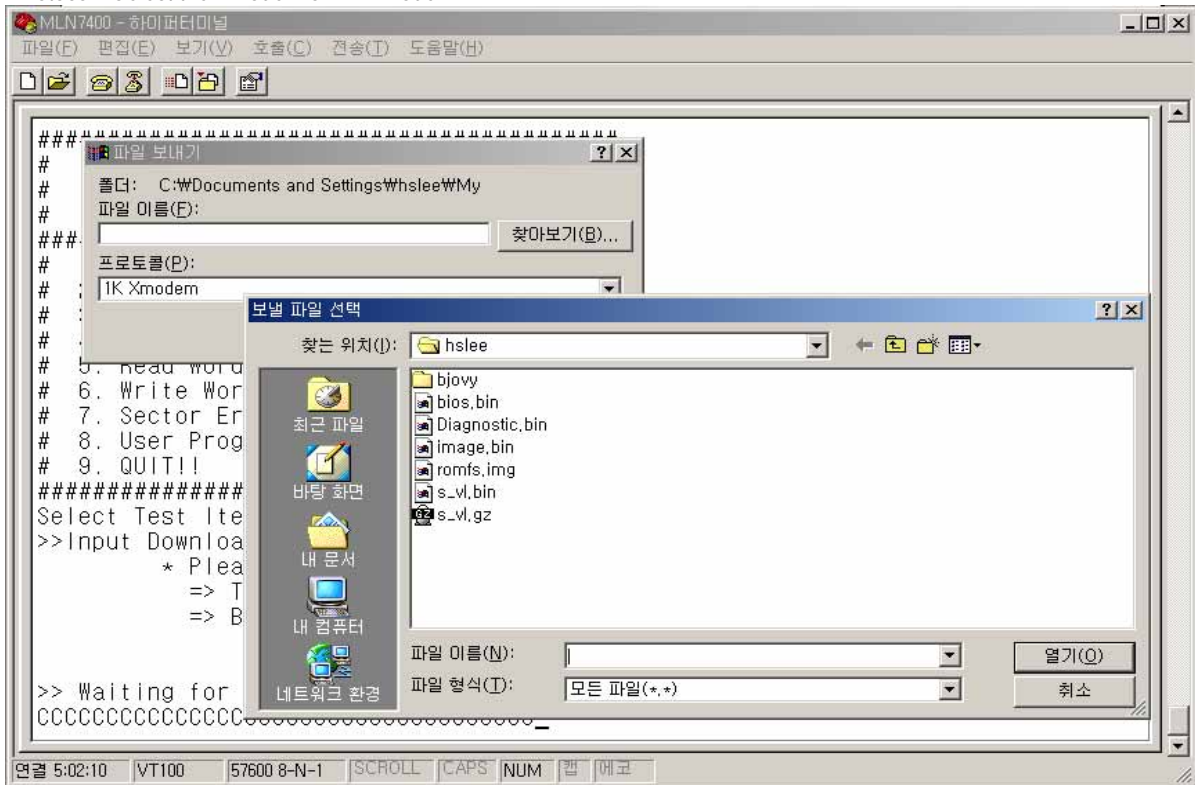
You can download a binary image file through the serial cable to target without an emulator.

1. Type "f" to download user program to EVM7400 on Diagnostic program main menu.

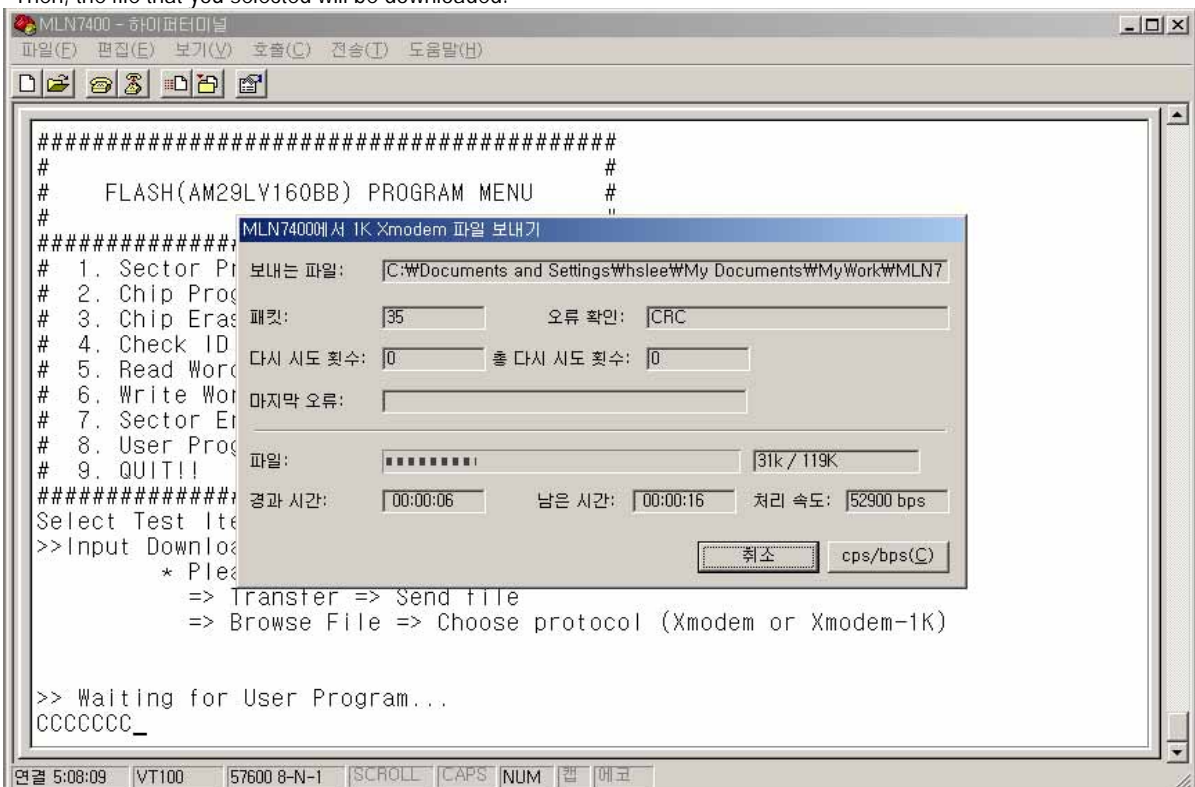




- select the Send File from the Transfer menu  
 File Name : Select the file name, which you want too download.  
 Protocol : Select the Xmodem or 1K Xmodem.



- Click Ok.  
 Then, the file that you selected will be downloaded.



## 4.2.2 Flash Write

You can write downloaded binary image at User flash memory(AM29LV160BB, U8).

Type "2" to write an executable binary file at User Flash memory.

Then, you can execute your image by changing Boot Rom selection switch(SW2) to X16(default is X8).

```

MLN7400 - 하이퍼터미널
파일(F) 편집(E) 보기(V) 호출(C) 전송(T) 도움말(H)

#####
#
#   FLASH(AM29LV160BB) PROGRAM MENU   #
#
#####
# 1. Sector Program(64KB)-[S]         #
# 2. Chip Program mode  -[C]         #
# 3. Chip Erase          -[E]         #
# 4. Check ID            -[I]         #
# 5. Read Word           -[R]         #
# 6. Write Word          -[W]         #
# 7. Sector Erase       -[T]         #
# 8. User Program Down  -[U]         #
# 9. QUIT!!             -[Q]         #
#####
Select Test Item :
Flash full Programming is started!!!!
[ID Check]
Manufacture ID= 1(0x0001), Device ID(0x2249)=2249
[Flash full Erase]
Chip Erase is started!!! : _

```

연결 2:58:06 VT100 57600 8-N-1 SCROLL CAPS NUM 캡 메코

## Chapter 5 Opennice32 Installation

### 5.1 OPENice32

The OPENice32 can also be connected with the EVB7400 as a debugging system for software applications development. OPENice32 is a JTAG-based, nonintrusive, debugging system for ARM-based controllers or processors. JTAG provides the interface between a debugger and the ARM-based controller development board.

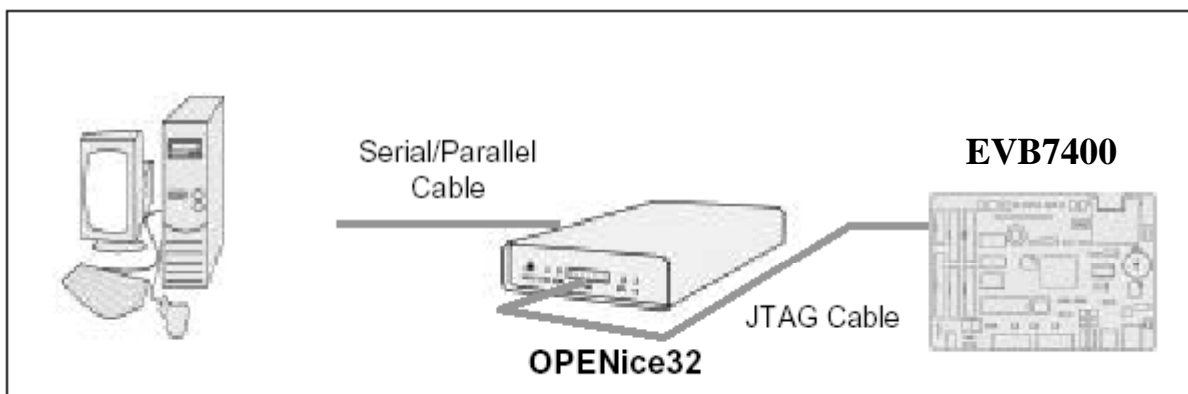
To use the OPENice32, the following additional equipment are required:

- OPENice32
- 14-way ribbon cable
- 9-pin RS232 cable or parallel cable
- 5 V DC (Max. 3A) power supply

### 5.2 Connecting EVB7400 and PC

The OPENice32 should be connected to the EVB7400's JTAG Port (J3) via a 20-way cable, and to the host PC via a 9-pin RS232 serial or parallel cable.

To power on the OPENice32, DC 5 V power supply is required.



[Figure 7 ] CONNECTING WITH OPENice32

### 5.3 Powering up the Board and OPENice32

We recommend that you power on the EVB7400 before the OPENice32 is powered on. In this way, the system initialization and memory configuration for EVB7400 performed by the Boot Code can be completed first.

Otherwise, it may cause the failure of code download via JTAG.

## Chapter 6 EVB7400 1.0 Schemetic and BOM

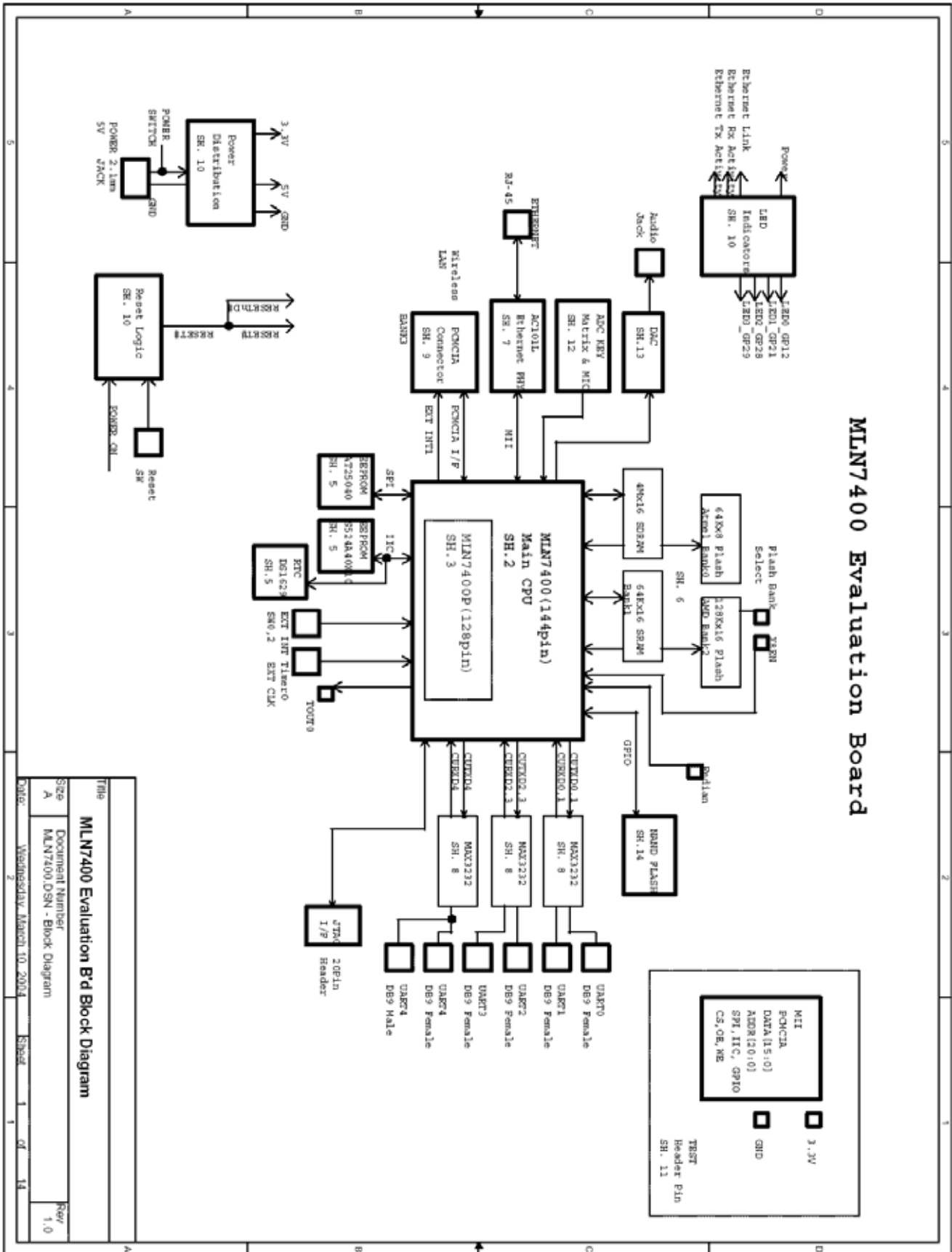
### 6.1 EVB7400 BOM

No.	PART NO	GEOMETRY	COUNT	DESCRIPTION	REFERENCE	Vendor
1	MLN7400	144LQFP	1	Microprocessor	U1	MCS Logic
2	MLN7400P	128TQFP	1	Microprocessor	U2	MCS Logic
3	AT24C256	8 SOIC	1	EEPROM(IIC)	U3	Atmel
4	AT25040	8 SOIC	1	EEPROM(SPI)	U4	Atmel
5	DS1629	8 SOIC	1	RTC	U5	Dallas
6	K6R1016V1D	44TSOP	1	SRAM	U6	Samsung
7	K4S641632	54TSOP	1	SDRAM	U7	Samsung
8	AM29LV160BB	48TSOP	1	Flash	U8	AMD
9	AT29C040A	32DIP	1	Flash	U9	Atmel
10	AC101L	48 TQFP	1	PHY	U10	Altima
11	H1102		1	Transformer	U11	PULSE
12	MAX3232	16 SOIC	3	RS232	U12, U13, U14	MAXIM
13	74LVC14		1		U15	
14	74LV08		1		U16	
15	AMS1086		1	Regulator	U17	semtech
16	MAX4468EKA	8pin SOT23	1	AMP	U18	MAXIM
17	CS4340	16 SOIC	1	Stereo DAC	U20	CRYSTAL
18	K9F2808-YCB0	48 TSOP	1	NAND Flash	U21	Samsung
19	Xtal_osc 10MHz	Half	1	Xtal-Oscillator (System CLK)	X2	
20	Xtal_osc 25MHz	Half	1	Xtal-Oscillator (PHY CLK)	Y2	
21	Crystal 32.768KHz	DIP(cylinder type)	1	Crystal(RTC)	Y1	
22	Crystal 10MHz	DIP(ATS Holder type)	1	Crystal (System CLK)	X1	
23	Xtal_oxc 1MHz	Half	1	Test CLK	X3	
24	Battery	CR2032	1	3V coin Battery	BT1	
25	Battery Connector		1			
26	PushButton SW		15	Reset, ExtInt	S1,S2,S3,SW4,SW5, SW6,SW7,SW8,SW9,SW10,SW11, SW12,SW13,SW14, SW15	
27	DPDT SW		3		SW1,SW2,SW16	
28	Power Toggle SW	3pin DIP	1	A12AP	SW3	NKK
29	1N4004	DIP	2	Diode	D1,D2	
30	1N4148	SMD	1	Diode	D3	
31	LED		5		D4,D5,D6,D7,D8	
32	PCMCIA 68Pin Con		1	ICM-C68H-S112- 400N1	J2	JST
33	RJ-45		1		J1	
34	HEADER 10X2		1	JTAG	J3	
35	POWER JACK		1	DC5V PWR	J4	
36	MIC IN JACK		1		J5	
37	AUDIO OUT JACK		1		J6	

38	DB9 FEMALE		5	UART0-4	P1,P2,P3,P4,P5
39	DB9 MAIL		1	HUART Option	P6
40	HEADER 13X2		4	DATA, MII, ADDRESS, MEMORY	JP3,JP4,JP6,JP8
41	HEADER 24X2		1	GPIO heaser	JP7
42	HEADER 4X2		1	IIC & SPI	JP2
43	HEADER 6X2		1	HUART header	JP5
44	HEADER 1		7	Test Pin	JP1,TP1,TP2,TP3,TP4 TP5, TP6
45	Beads(100Mhz)	2012	1	L	L1
46	0	0603(1608)	68	R	R8,R9,R10,R11,R12, R13,R14,R15,R16,R17, R18,R19,R20,R21,R22, R23,R24,R25,R26,R27, R28,R29,R30,R31,R32, R33,R34,R35,R36,R37, R38,R39,R40,R41,R42, R43,R44,R45,R46,R47, R48,R49,R50,R51,R52, R53,R54,R55,R56,R57, R58,R59,R60,R61,R62, R63,R72,R73,R74,R77, R80,R176,R177,R180,R181, R200,R201,R202
47	0	1206(3216)	4	R	R204,R205,R206,R207
48	33	0603(1608)	12	R	R2,R3,R5,R65,R85 R86,R87,R88,R95,R96 R97,R107
49	49.9	0603(1608)	4	R	R89,R90,R91,R92
50	75	0603(1608)	5	R	R84,R103,R104,R105,R106
51	100	0603(1608)	1	R	R178
52	270	0603(1608)	3	R	R155,R,156,R157
53	330	0603(1608)	5	R	R144,145,R146,R147,R151
54	390	0603(1608)	3	R	R158,R159,R160
55	500	0603(1608)	2	R	R93 R94
56	560	0603(1608)	4	R	R161,R162,R172,R174
57	820	0603(1608)	1	R	R163
58	1K	0603(1608)	10	R	R4,R7,R79,R82,R83 R152, R153,R154,R164,R168
59	2K	0603(1608)	4	R	R66,R67,R69,R70
60	3K	0603(1608)	1	R	R179
61	2.2K	0603(1608)	1	R	R167
62	4.7K	0603(1608)	50	R	R6,R64,R68,R71,R75, R76,R78,R81,R98,R99, R100,R101,R108,R109,R110,R111, R112,R113,R114,R115,R116,R117, R118,R119,R120,R121,R122,R123, R124,R125,R126,R127,R128,R129, R130,R131,R132,R133,R134,R135, R136,R137,R138,R139,R140,R141, R142,R143,R150,R166
63	10K	0603(1608)	5	R	R102,R148,R149,R173,R175
64	20K	0603(1608)	1	R	R171

65	100K	0603(1608)	3	R	R165,R169,R170
66	1M	0603(1608)	1	R	R1
67	0.01uF_2kV	DIP	1		C56
68	0.01uF	0603(1608)	9	C	C47,C57,C58,C59,C60, C61,C62,C83,C87
69	0.1uF	0603(1608)	65	C	C1,C2,C3,C4,C5, C6,C7,C8,C9,C10, C11,C12,C15,C17,C18, C19,C20,C21,C22,C23, C24,C25,C26,C27,C28, C29,C32,C33,C34,C35, C36,C37,C38,C39,C40, C41,C42,C43,C44,C45, C46,C48,C50,C52,C63, C64,C65,C66,C79,C80, C81,C82,C85,C89,C92, C93,C94,C96,C97,C183, C184,C185,C186C187,C188
70	1uF	0603(1608)	6	C	C51,C53,C54,C55,C90, C91
71	20pF	0603(1608)	2	C	C13,C14
72	22pF	0603(1608)	2	C	C30,C31
73	27pF	0603(1608)	1	C	C49
74	47pF	0603(1608)	1	C	C88
75	100pF	0603(1608)	1	C	C95
76	330pF	0603(1608)	12	C	C67,C68,C69,C70,C71, C72,C73,C74,C75,C76, C77,C78
77	820pF	0603(1608)	1	C	C16
78	1uF	SMD A(3216)	17	T/C	TC11,TC12,TC13,TC14,TC15TC16, TC17,TC18,TC19,TC20TC21,TC22, TC37,TC38,TC39 TC41, TC42
79	2.2uF	SMD A(3216)	2	T/C	TC9,TC10
80	3.3uF	SMD A(3216)	2	T/C	TC35,TC36
81	10uF	SMD B(3528)	8	T/C	TC3,TC6,TC7,TC25,TC26, TC28,TC29,TC34
82	22uF	SMD B(3528)	1	T/C	TC8
83	47uF	SMD C(6032)	6	T/C	TC1,TC2,TC4,TC5,TC23, TC24
84	100uF	SMD D(7343)	3	T/C	TC27,TC31,TC33

6.2 EVB7400 Schematic

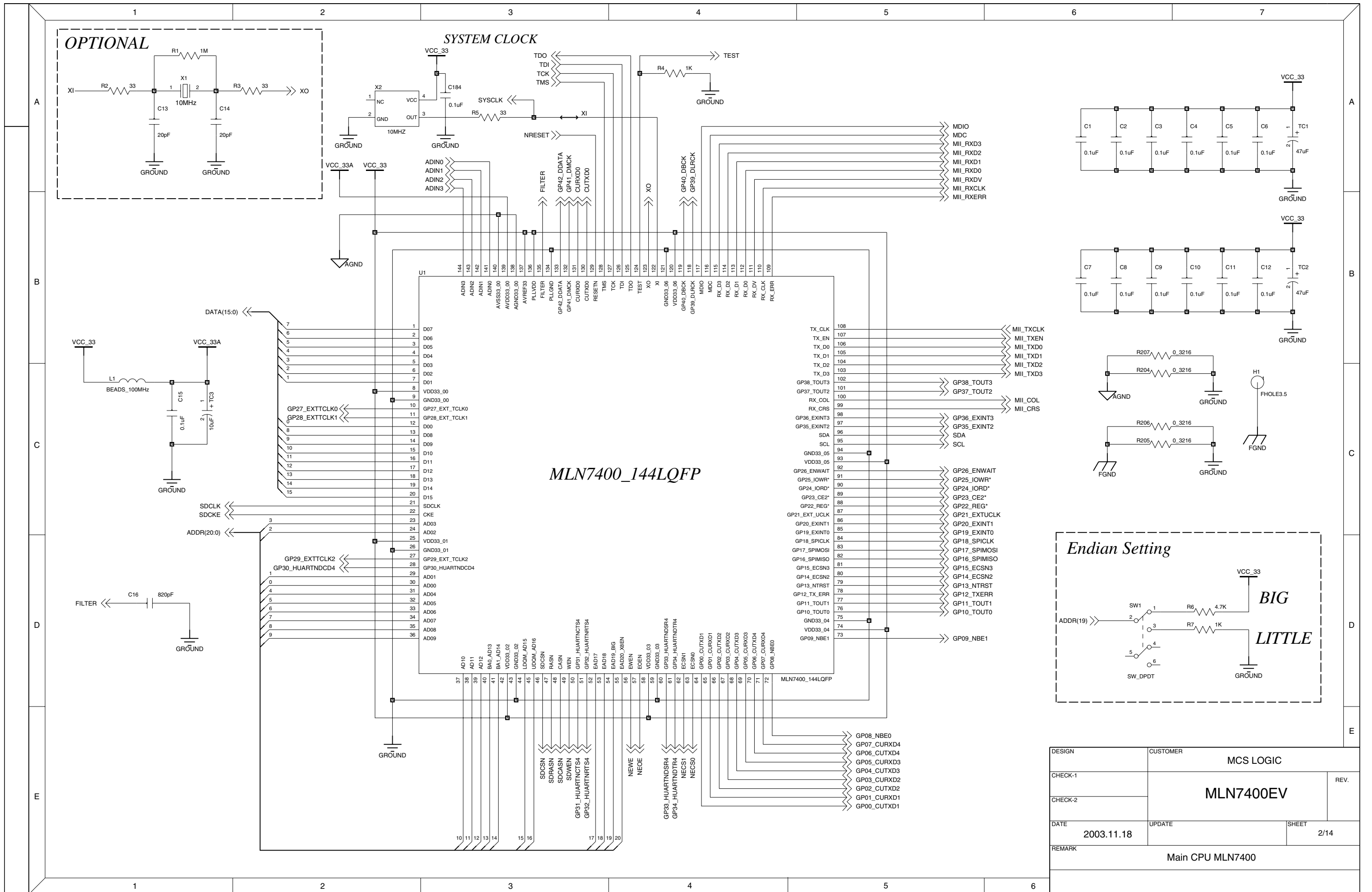


Title		MLN7400 Evaluation B'D Block Diagram	
Doc No	Document Number	MLN7400.DSN - Block Diagram	
Rev	Revision	1	1.0
Date	Wednesday, March 10, 2004	Sheet	1 of 14

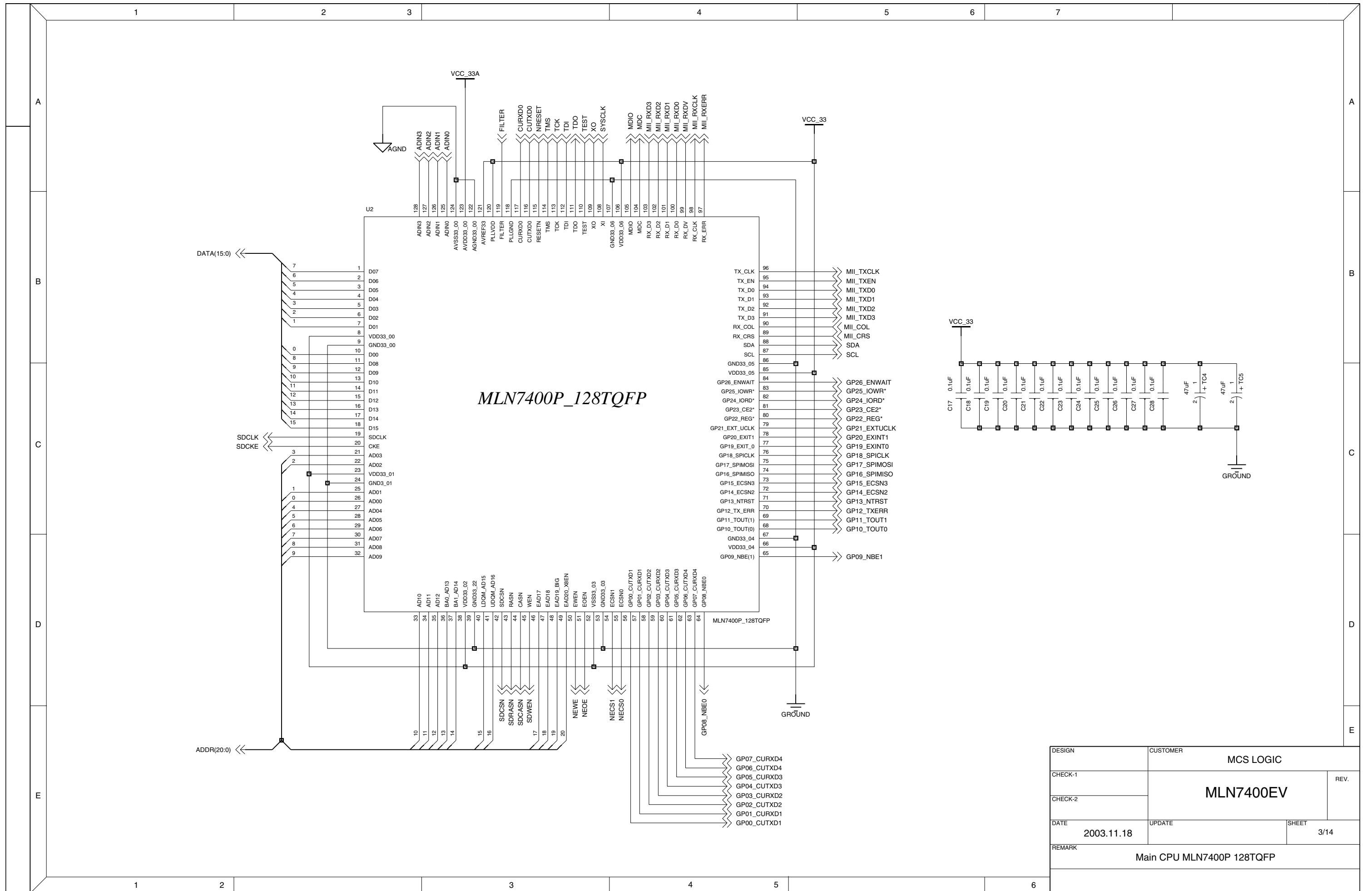


# *MLN7400 Evaluation Board*

DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	REV.		MLN7400EV
CHECK-2			
DATE	2003.11.18	UPDATE	SHEET 1 / 14
REMARK	BLOCK DIAGRAM		



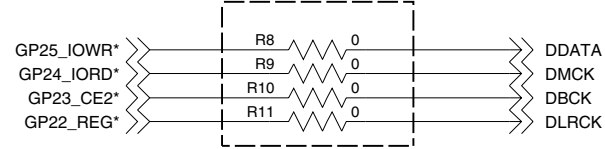
DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	REV.		
CHECK-2	MLN7400EV		
DATE	2003.11.18	UPDATE	SHEET 2/14
REMARK	Main CPU MLN7400		



DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	REV.		
CHECK-2	MLN7400EV		
DATE	2003.11.18	UPDATE	SHEET 3/14
REMARK	Main CPU MLN7400P 128TQFP		

**Do not install**

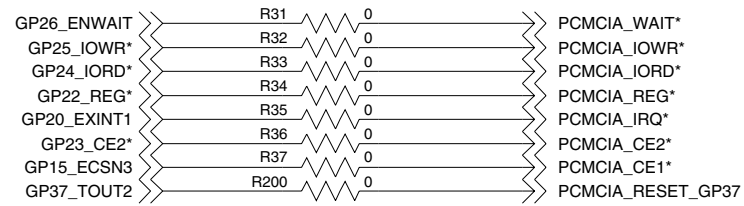
Only use when CPU is MLN7400P and need to use DAC



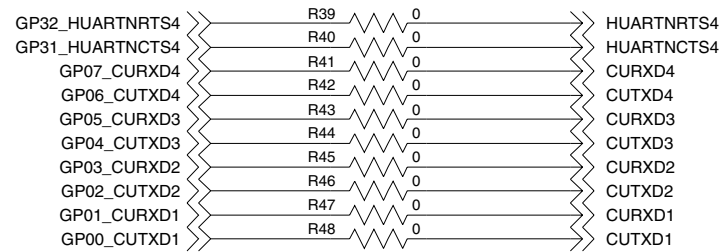
**MLN7400P  
DAC I/F**



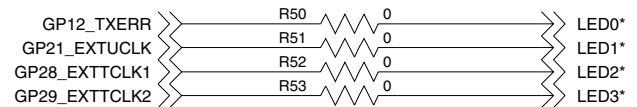
**DAC I/F**



**PCMCIA  
I/F**



**CUART  
I/F**



**LED  
I/F**



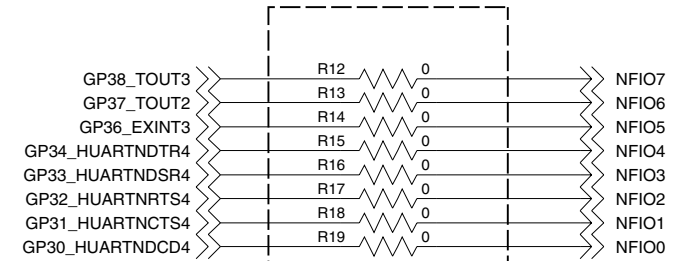
**SPI  
I/F**



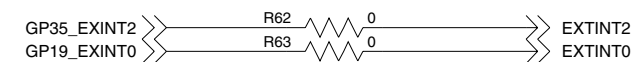
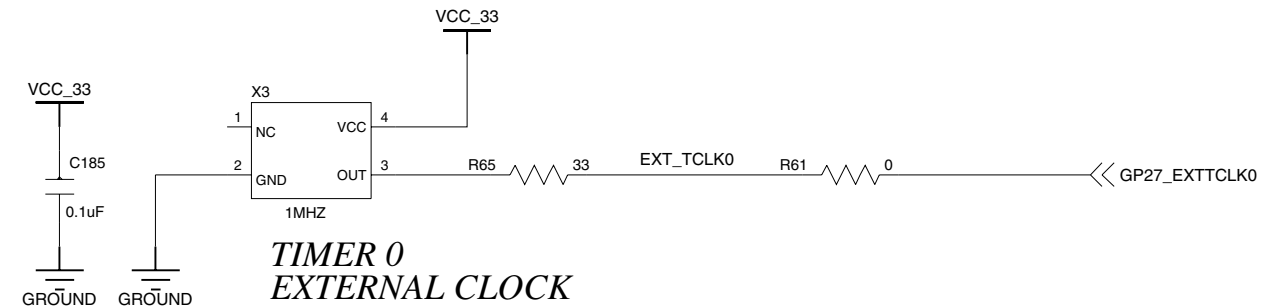
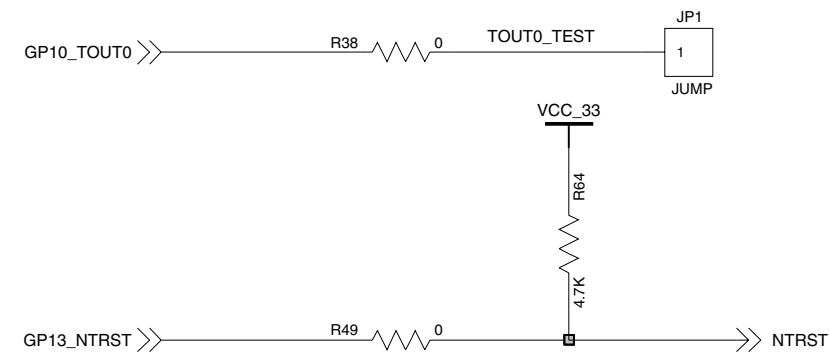
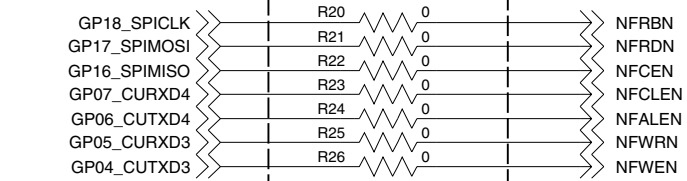
**SRAM  
I/F**

**OPTIONAL**

Install to use NAND Flash

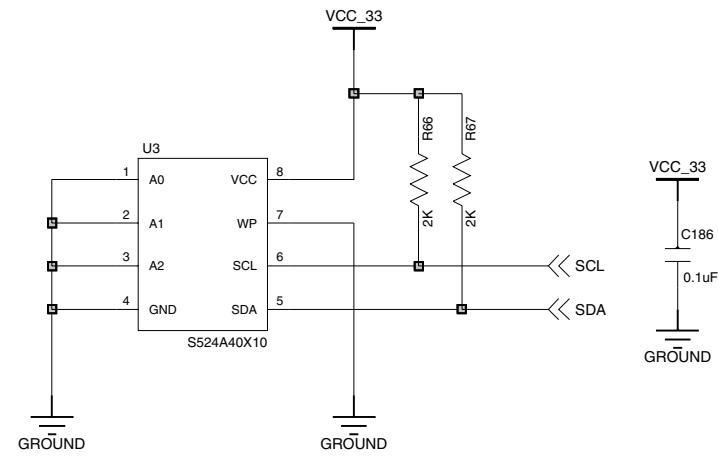


**NAND  
FLASH  
I/F**

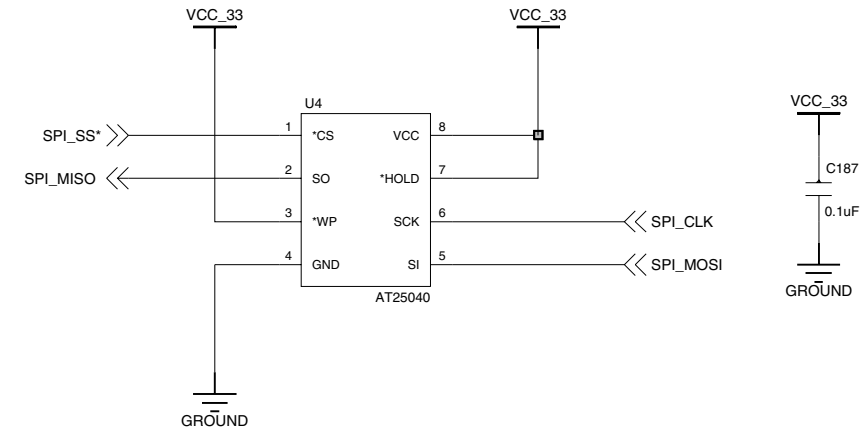


DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	MLN7400EV		REV.
CHECK-2			
DATE	2003.11.18	UPDATE	SHEET 4/14
REMARK	GPIO		

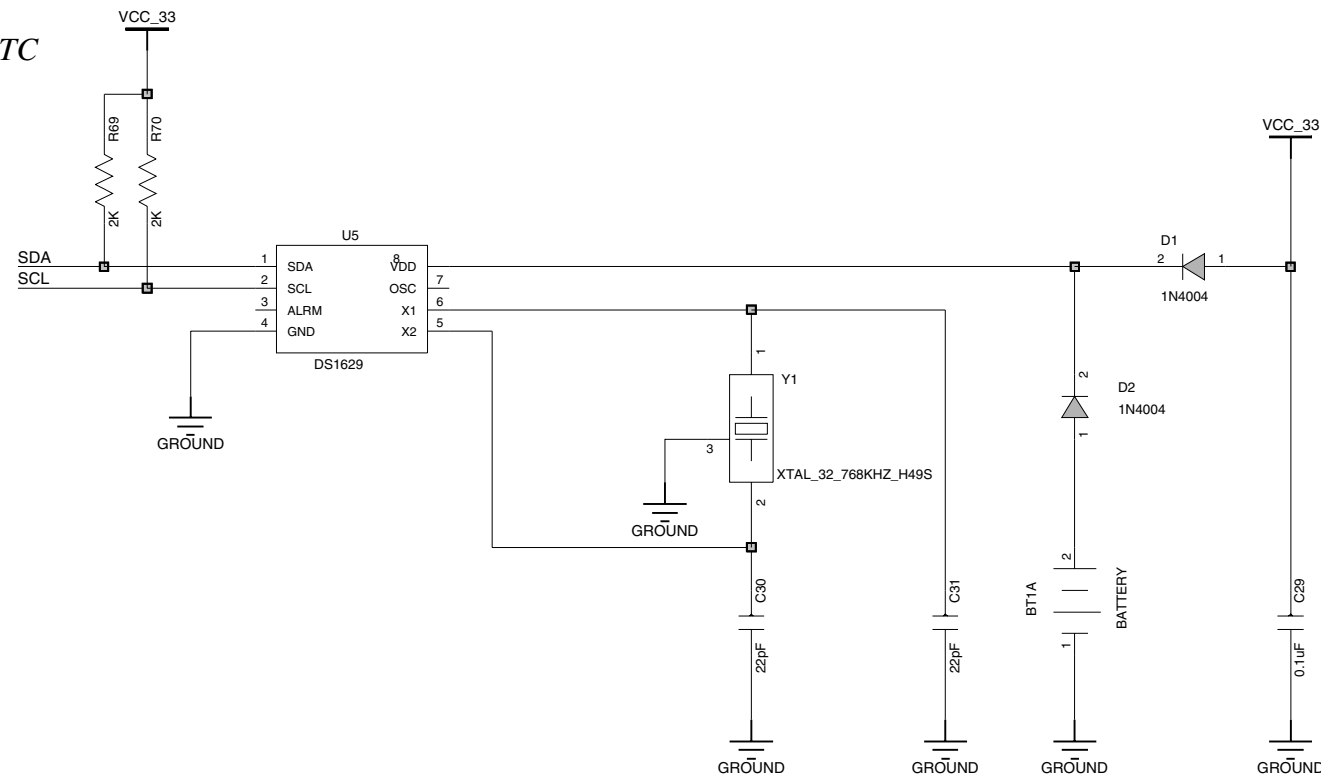
*IIC EEPROM*



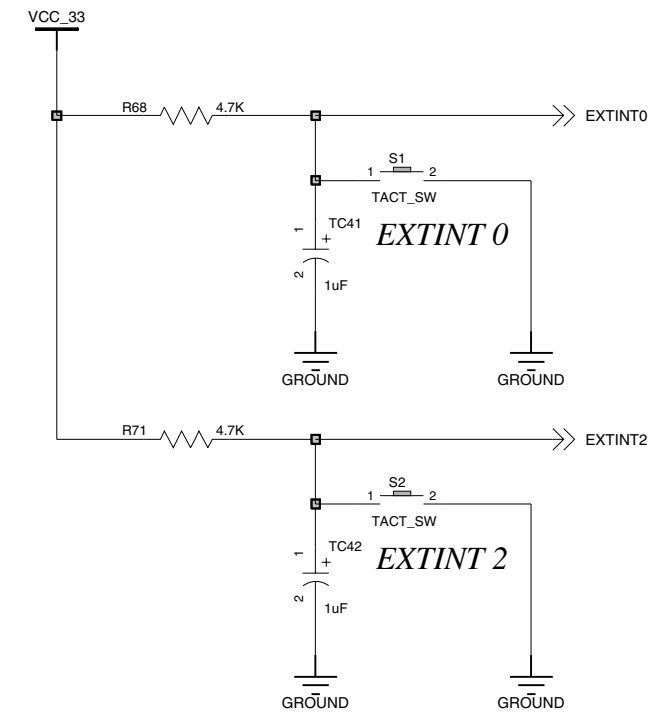
*SPI EEPROM*



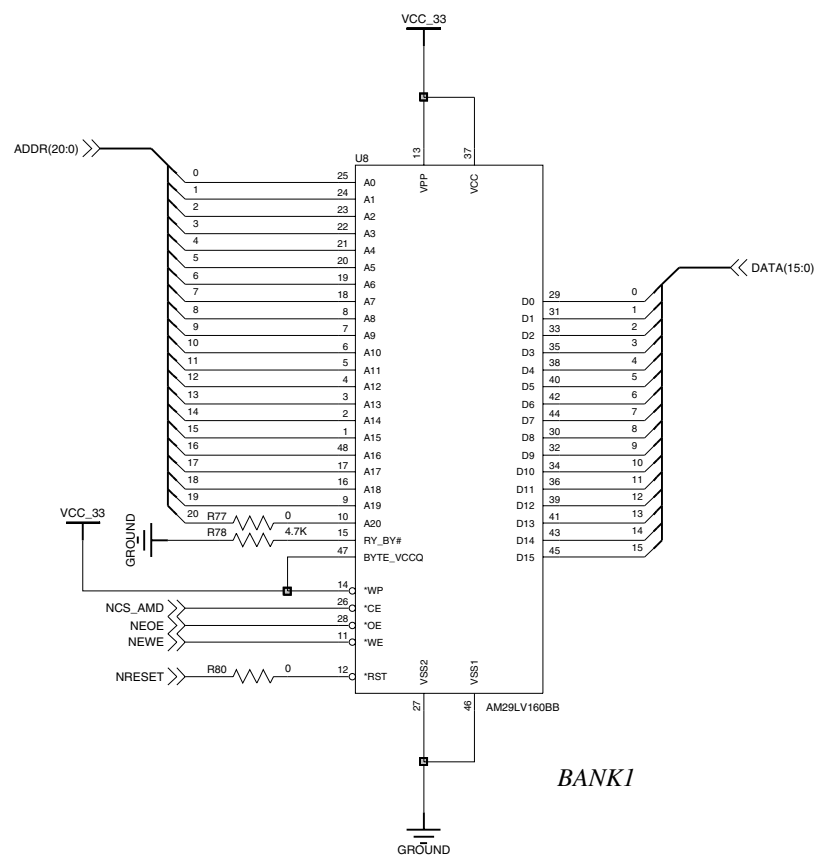
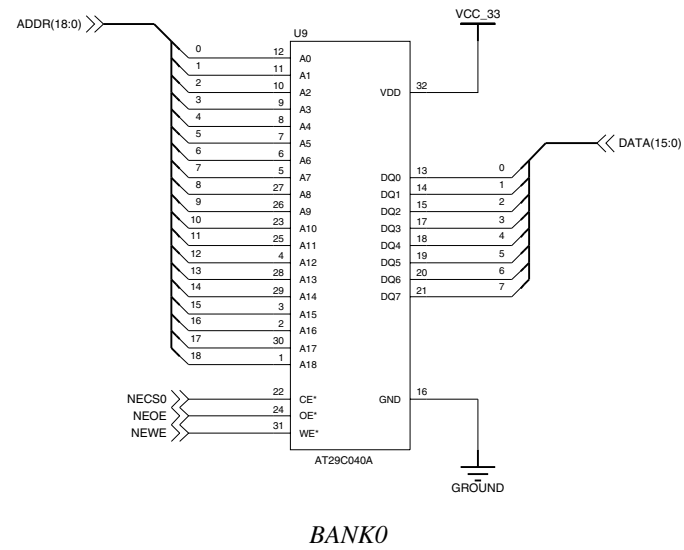
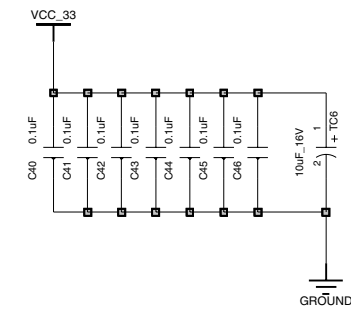
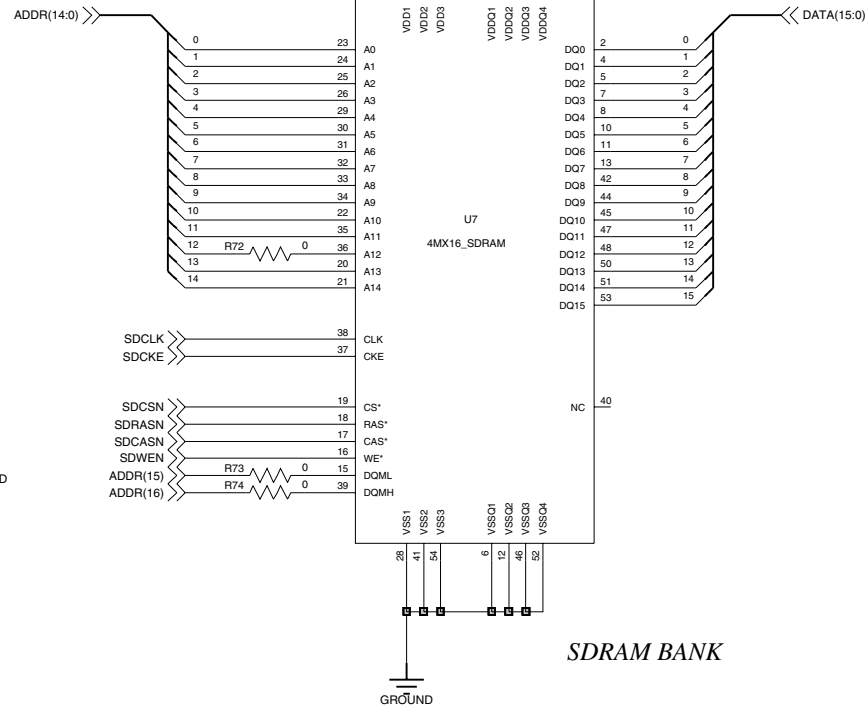
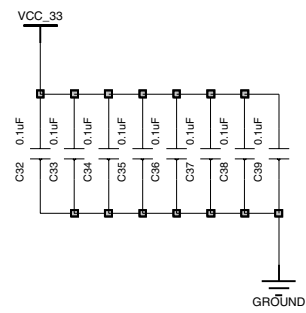
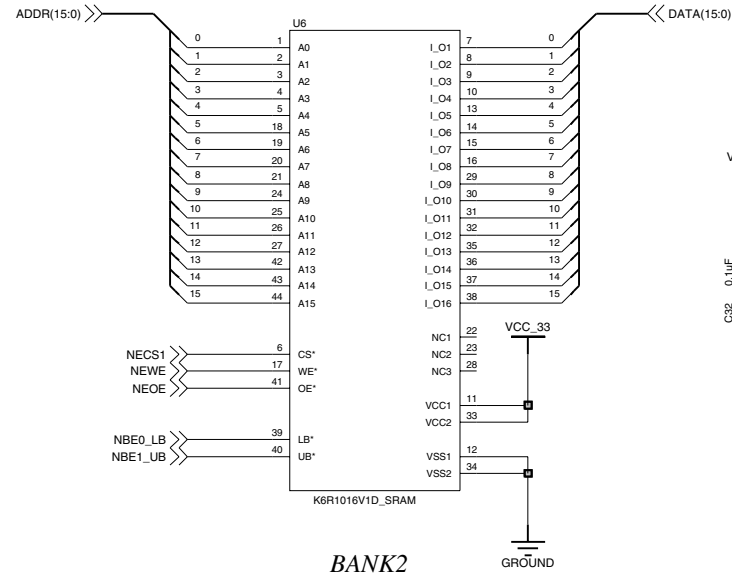
*RTC*



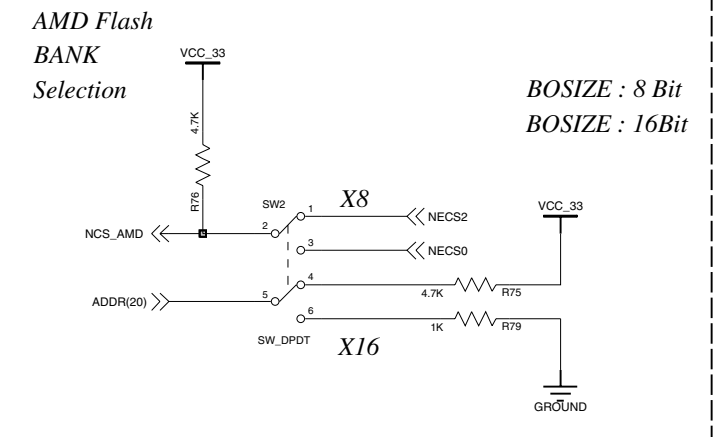
*External Interrupt Test*



DESIGN	CUSTOMER		
	MCS LOGIC		
CHECK-1	MLN7400EV		REV.
CHECK-2			
DATE	UPDATE	SHEET	
2003.11/18		5/14	
REMARK			
EEPROM & RTC			

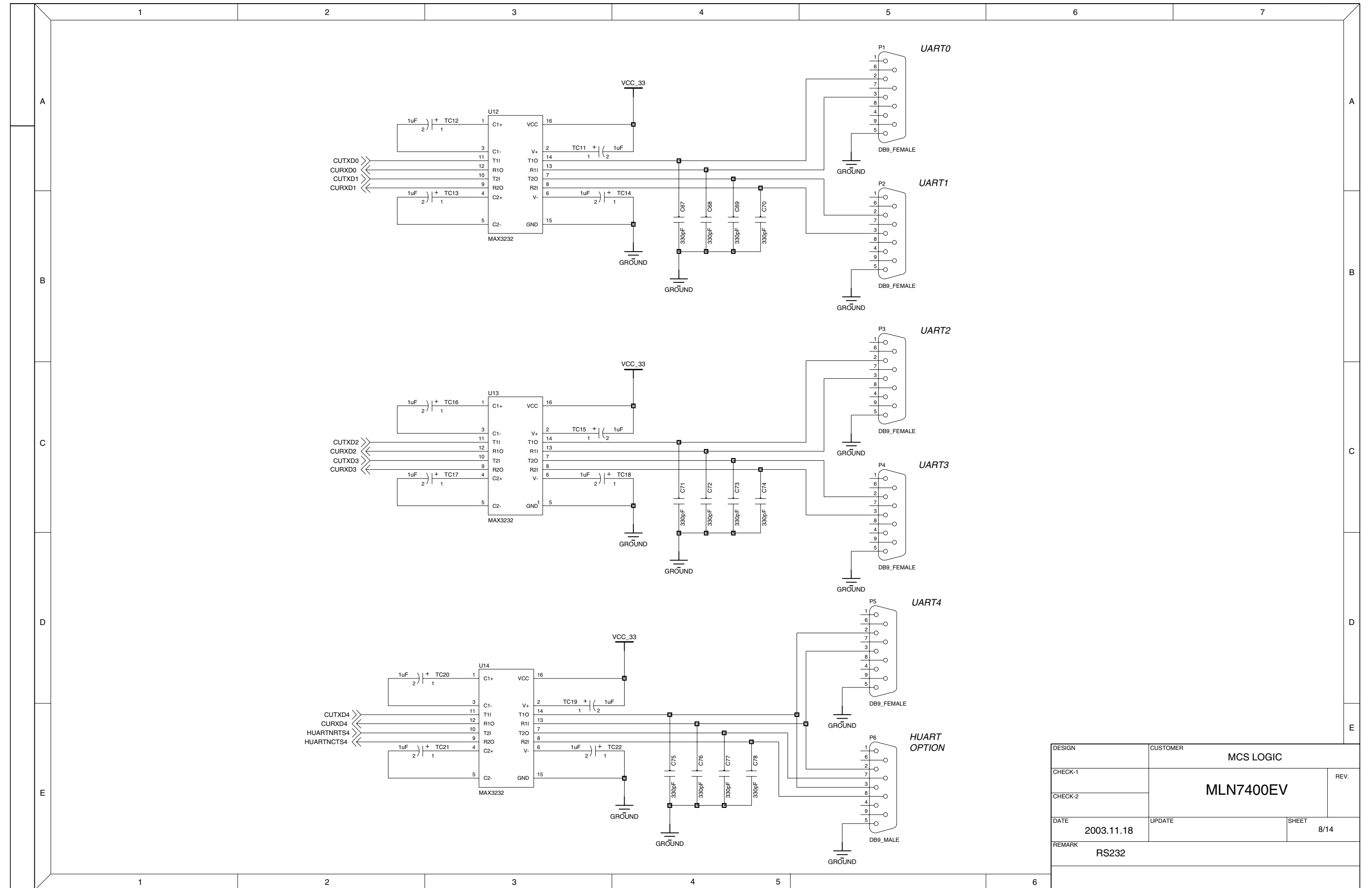


**FLASH**



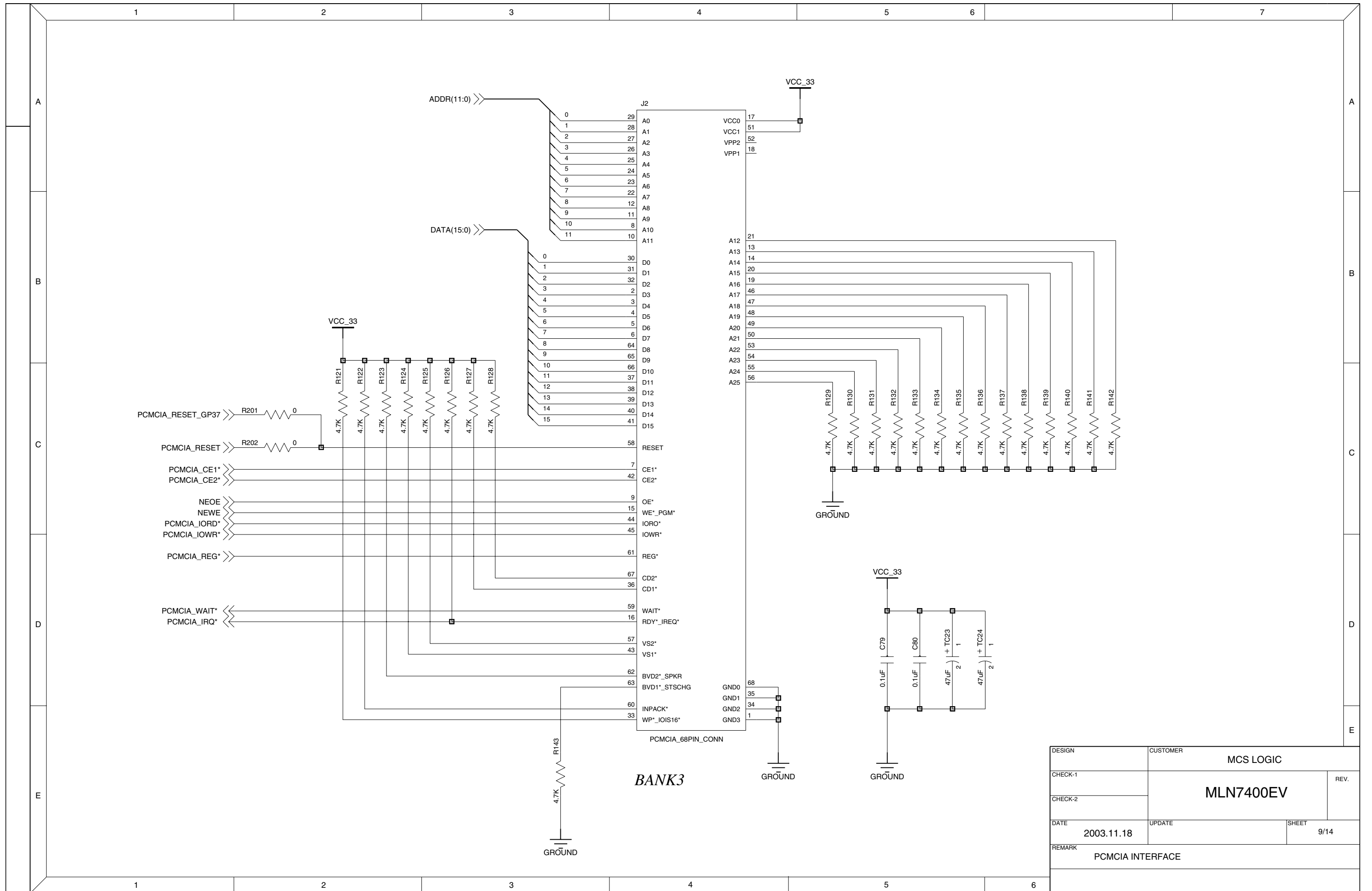
DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	MLN7400EN		REV.
CHECK-2			
DATE	2003.11.18	UPDATE	SHEET 6/14
REMARK	MEMORY		





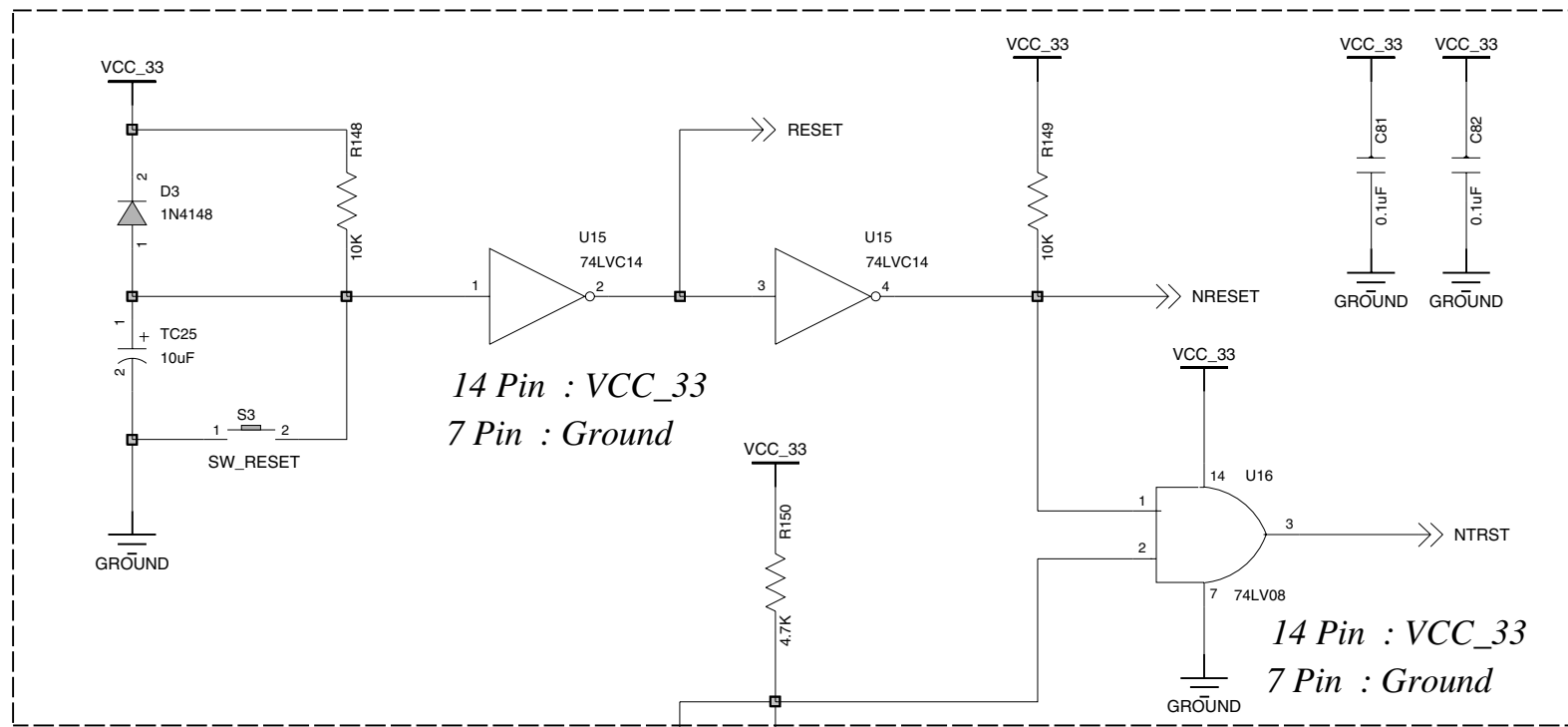
DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	REV.		
CHECK-2	MLN7400EV		
DATE	2003.11.18	UPDATE	SHEET 8/14
REMARK	RS232		



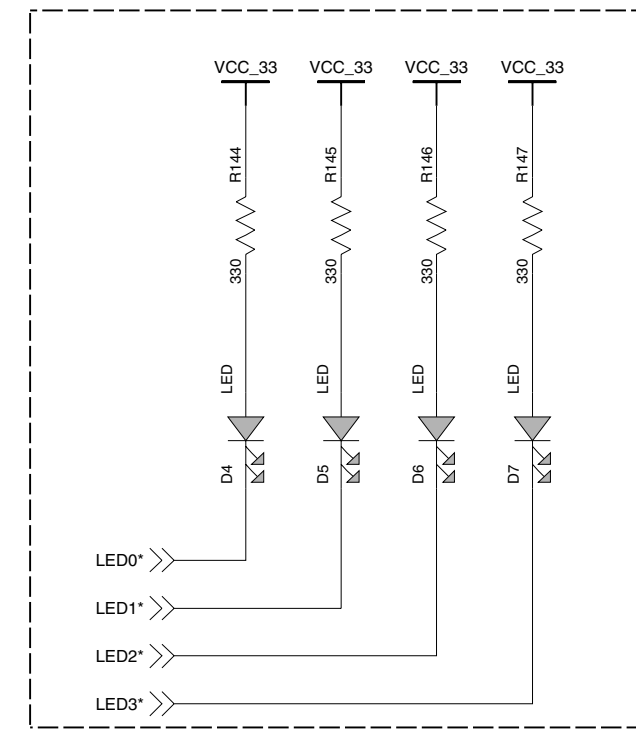


DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	MLN7400EV		REV.
CHECK-2			
DATE	2003.11.18	UPDATE	SHEET 9/14
REMARK	PCMCIA INTERFACE		

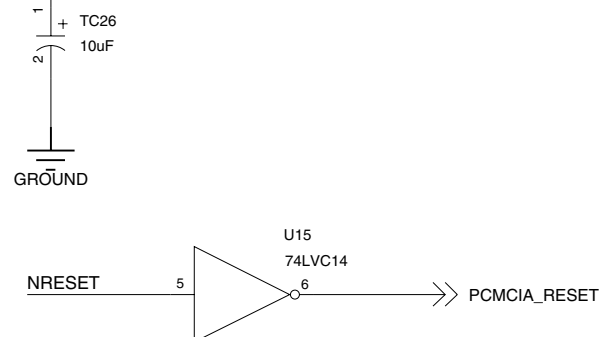
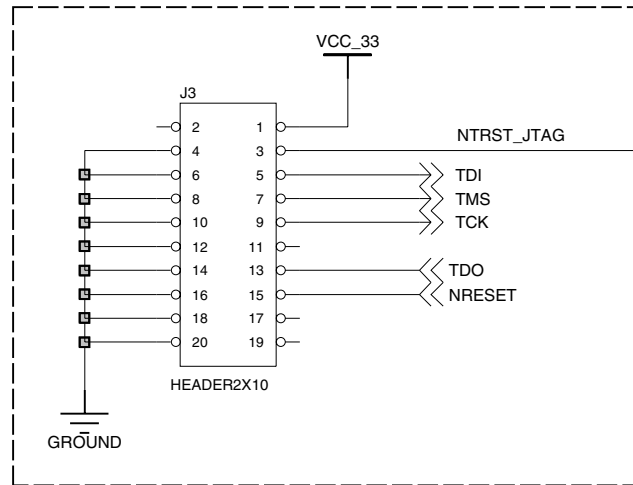
### RESET SYSTEM



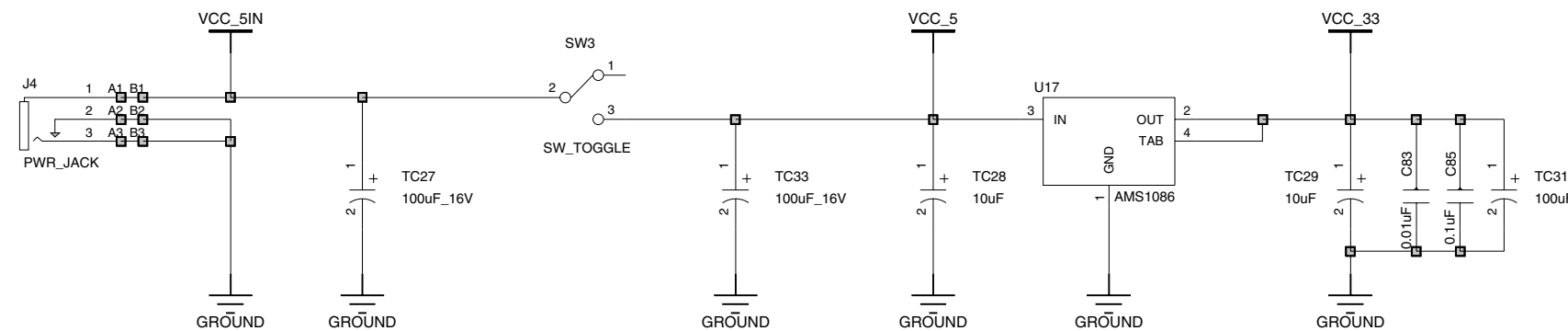
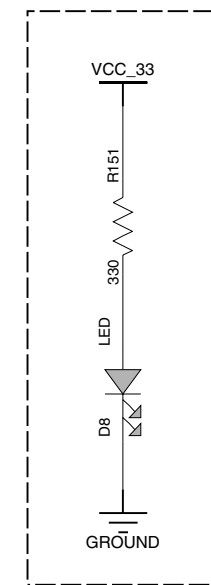
### GPIO LED



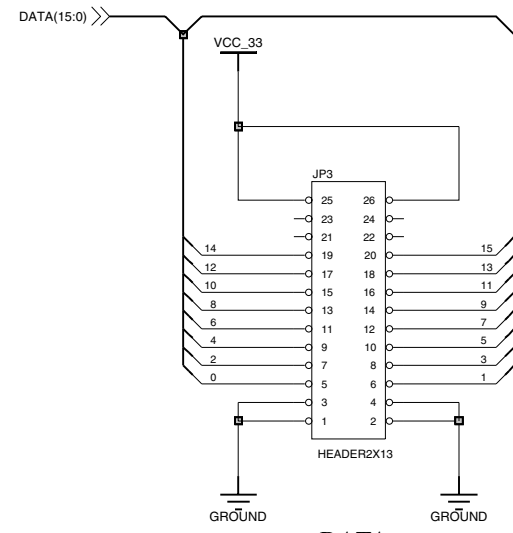
### JTAG CONNECTOR



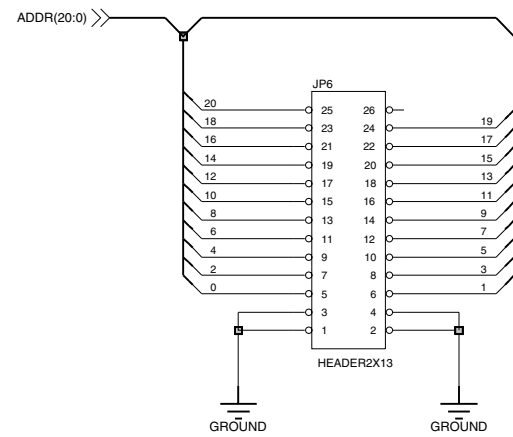
### POWER LED



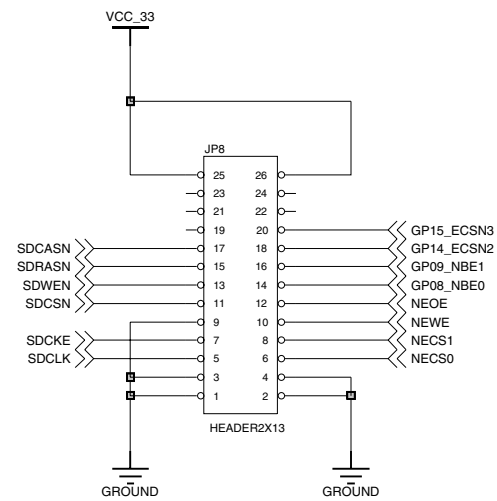
DESIGN	CUSTOMER	
CHECK-1	MCS LOGIC	
CHECK-2	MLN7400EV	
DATE	UPDATE	SHEET
2003.11.18		10/14
REMARK		
POWER&RESET		



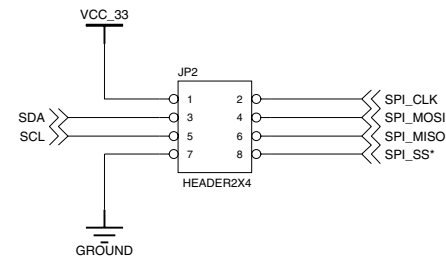
**DATA  
HEADER**



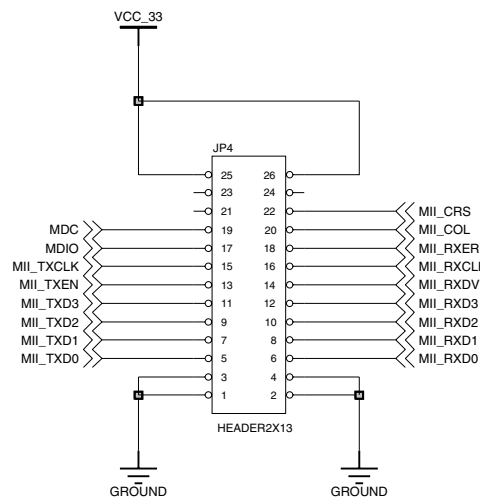
**ADDRESS  
HEADER**



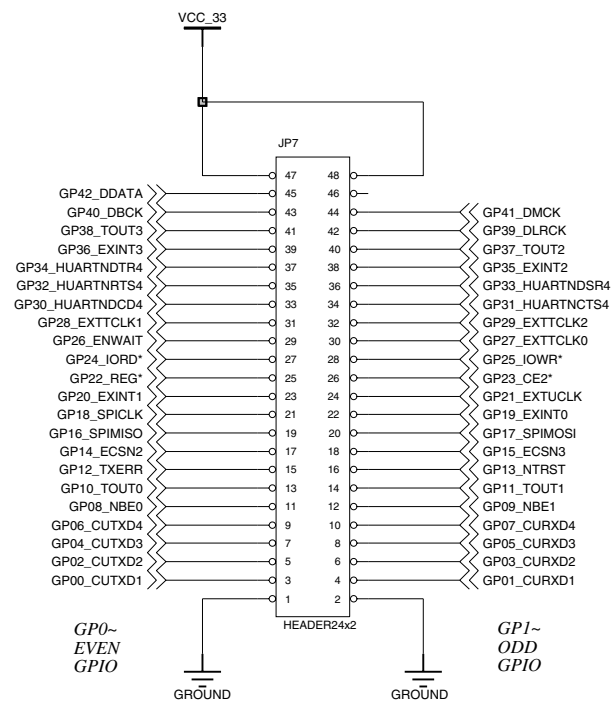
**MEMORY  
HEADER**



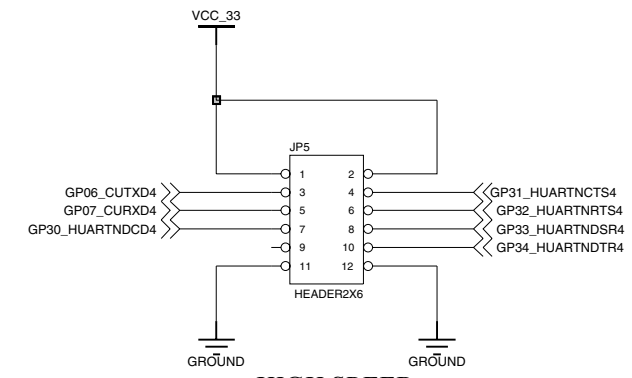
**IIC & SPI  
HEADER**



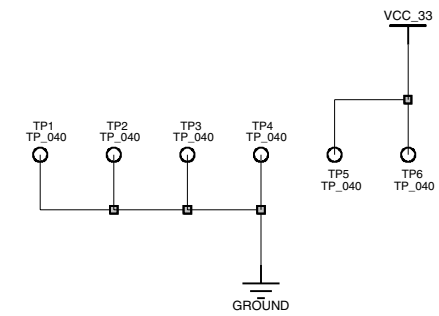
**MII I/F  
HEADER**



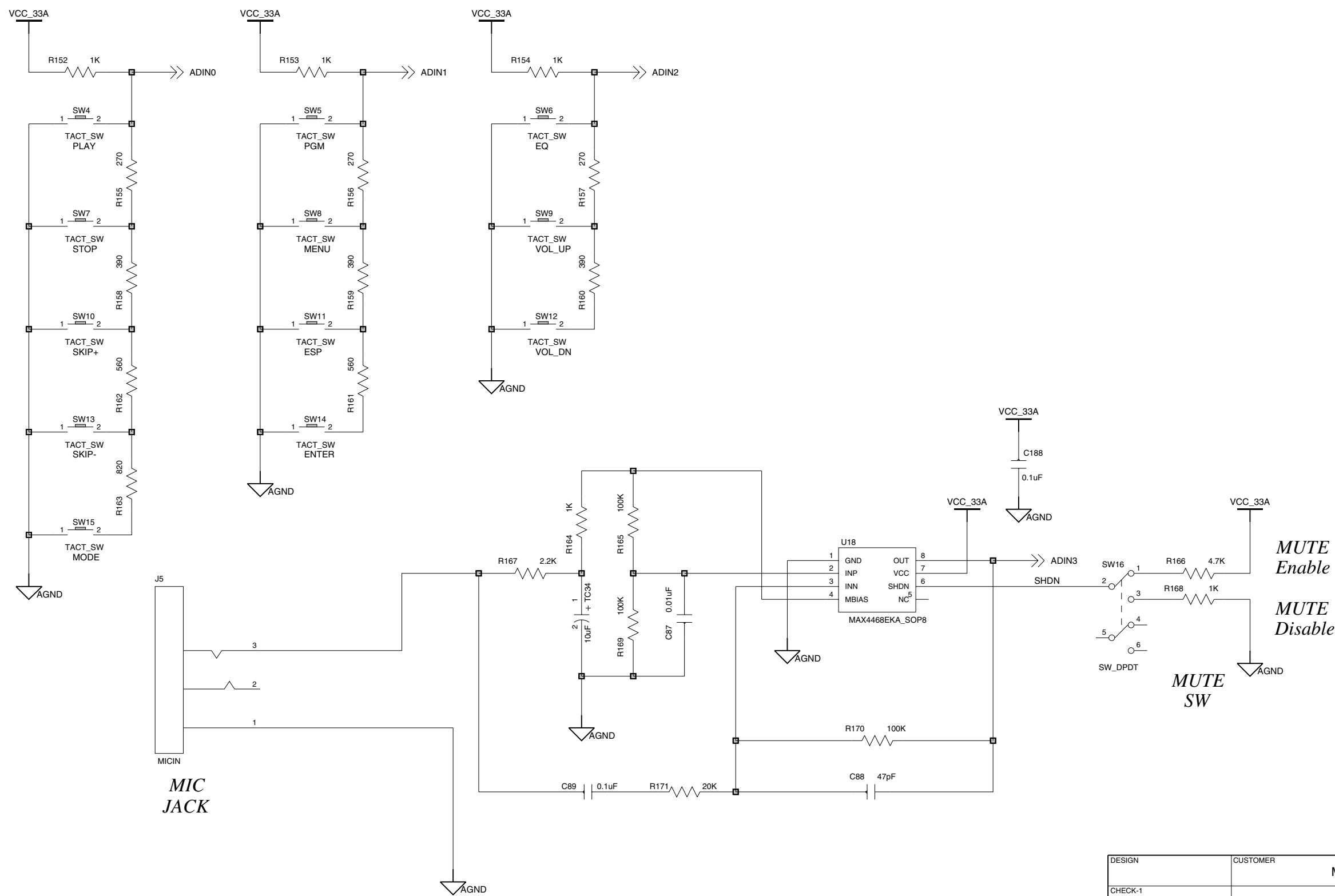
**GPIO  
HEADER**



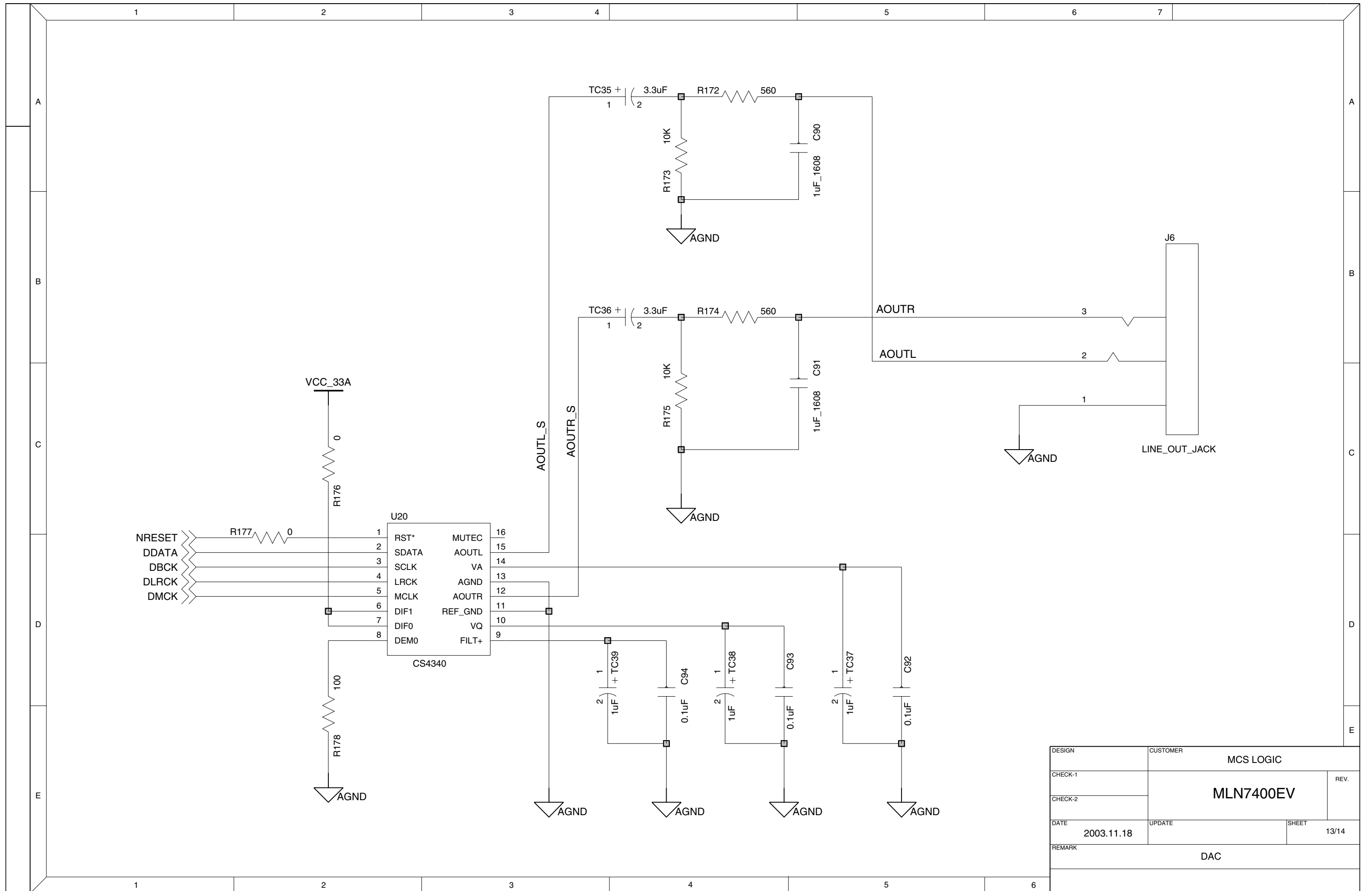
**HIGH SPEED  
UART  
HEADER**



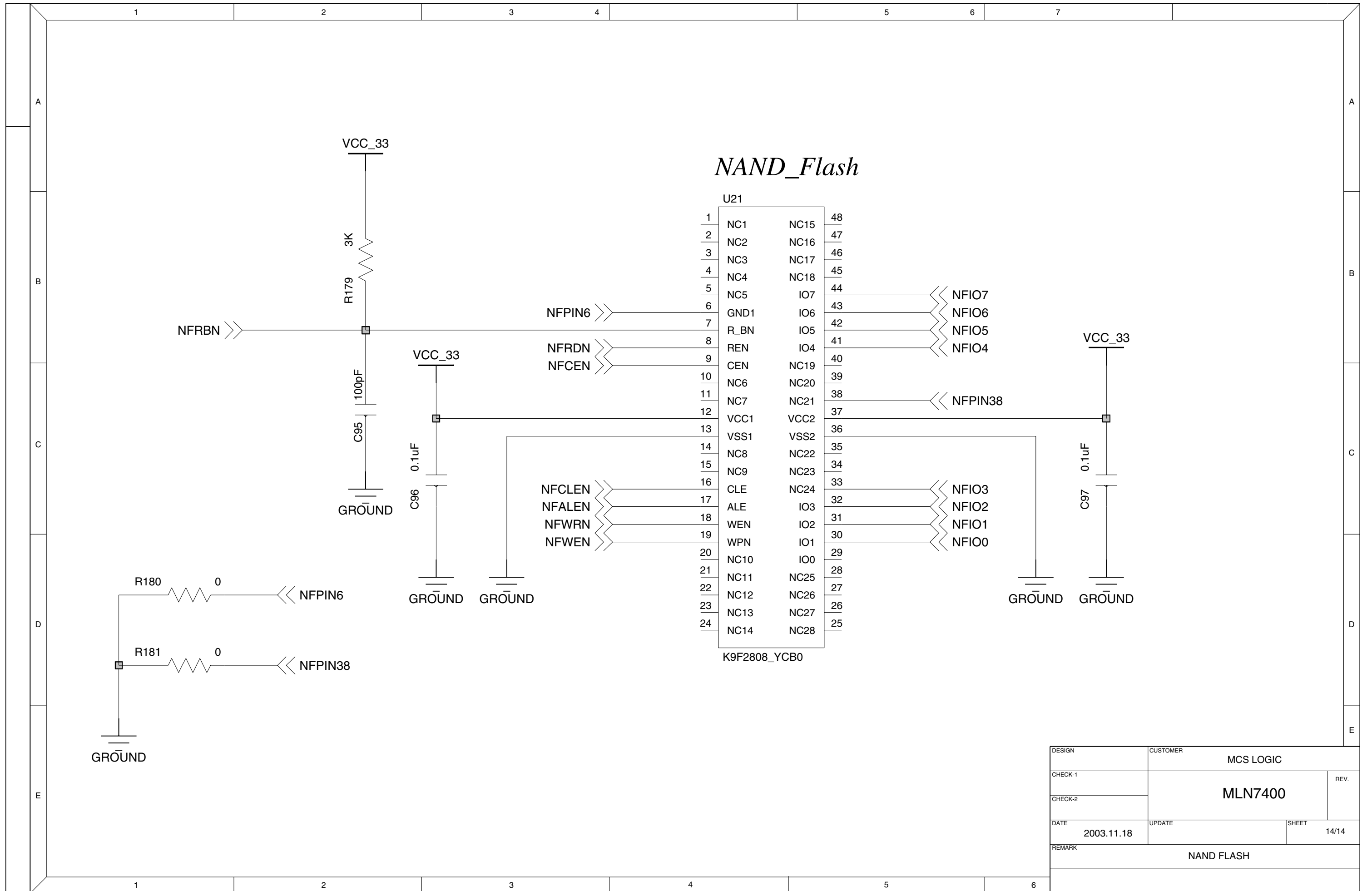
DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	MLN7400EV		REV.
CHECK-2			
DATE	2003.11.18	UPDATE	SHEET 11/14
REMARK	Test Header Pin		



DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	REV.		
CHECK-2	MLN7400EV		
DATE	2003.11.18	UPDATE	SHEET 12/14
REMARK	KEY MATRIX & MIC IN		



DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	REV.		
CHECK-2	MLN7400EV		
DATE	2003.11.18	UPDATE	SHEET 13/14
REMARK	DAC		



DESIGN	CUSTOMER		MCS LOGIC
CHECK-1	MLN7400		REV.
CHECK-2			
DATE	2003.11.18	UPDATE	SHEET 14/14
REMARK	NAND FLASH		

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