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MS-7358 uATX Version: 4.0

CPU: Intel Pentium 4, Pentium D, Core2 Duo, Wolfdale, Kentsfield and Yorkfield processors in LGA775 Package.

System Chipset:

Intel Bearlake - Q35 North Bridge
Intel ICH9 (DO South Bridge)

On Board Device:

CLOCK Gen ICS 9LPRS906
LPC Super I/O -- Fintek F71882F
LPC TPM -- SLB9635
LAN -- INTEL NINEVEH/EKRON
HD Audio Codec -- ALC883
1394 Controller -- VT6308 (2-port)
PCIE to PATA Bridge -- Marvel 88SE6111

Main Memory:

Dual-channel DDR-II * 4

Expansion Slots:

PCI EXPRESS X16 SLOT *1
PCI EXPRESS X1 SLOT *1
PCI SLOT * 2

PWM: Intersil ISL6322 (4 Phases) w/ ISL6612 driver

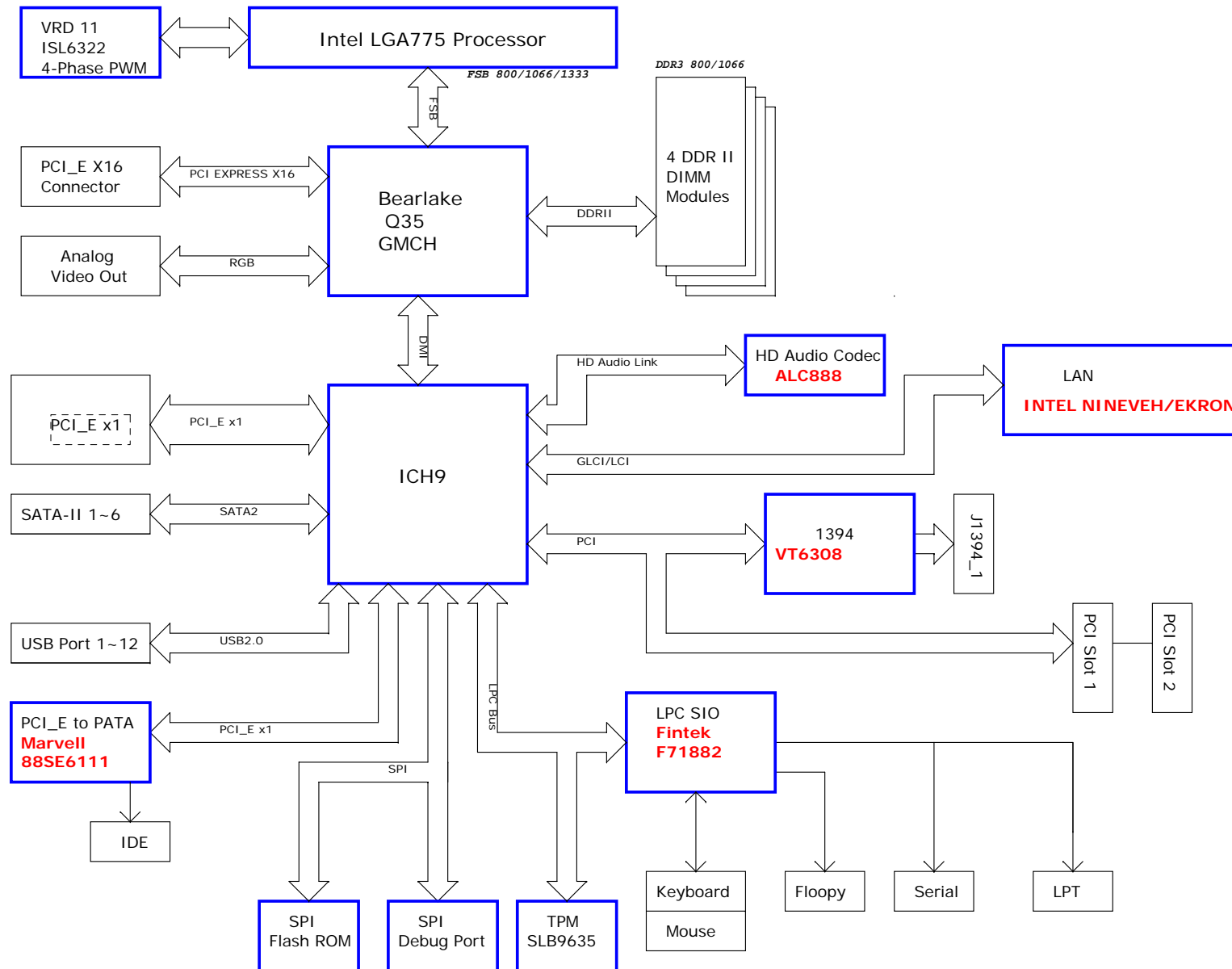
Configuration and BOM match up

Option	Function	Orcad Configure	BOM
STD	Bearlake-Q35/ICH9DO	cfg-7358-STD	



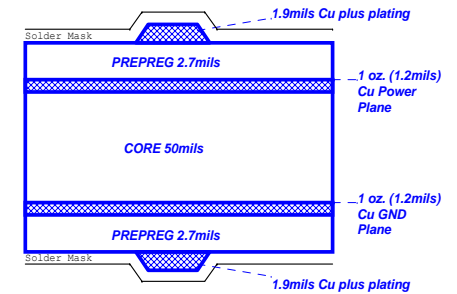
MICRO-STAR INT'L CO.,LTD			
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Block Diagram



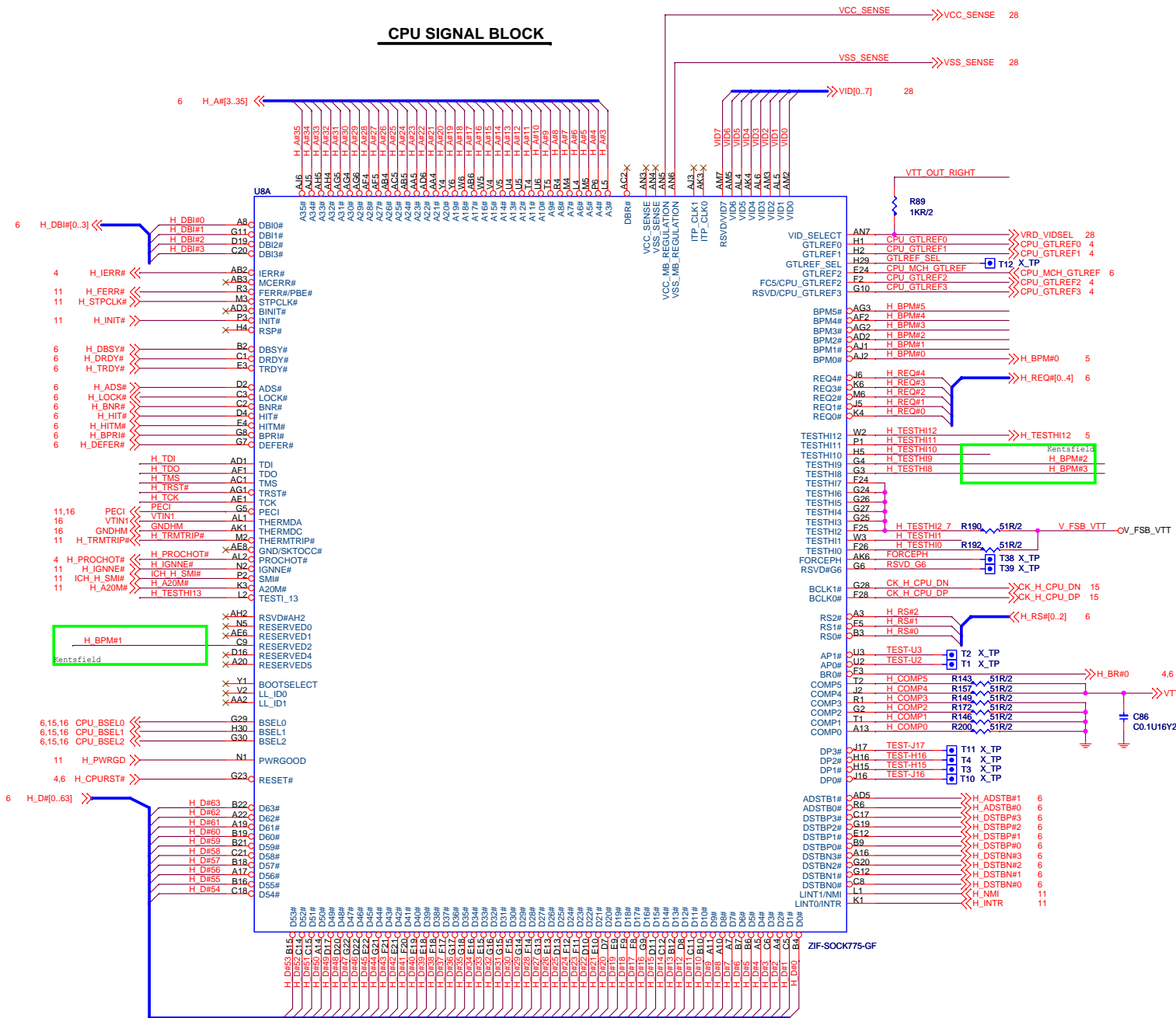
Board Stack-up

(1080 Prepreg Considerations)

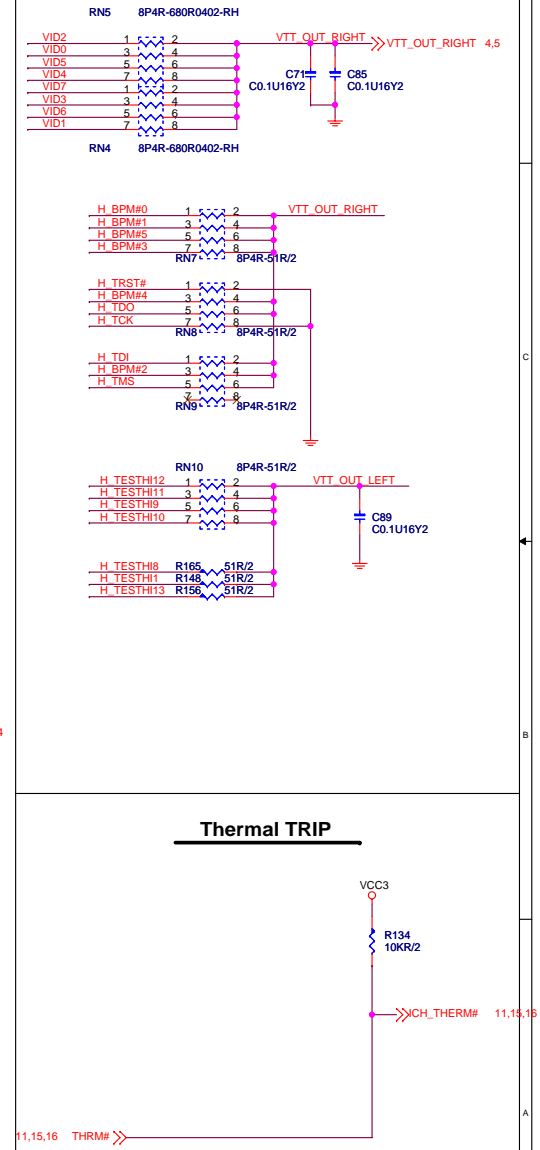


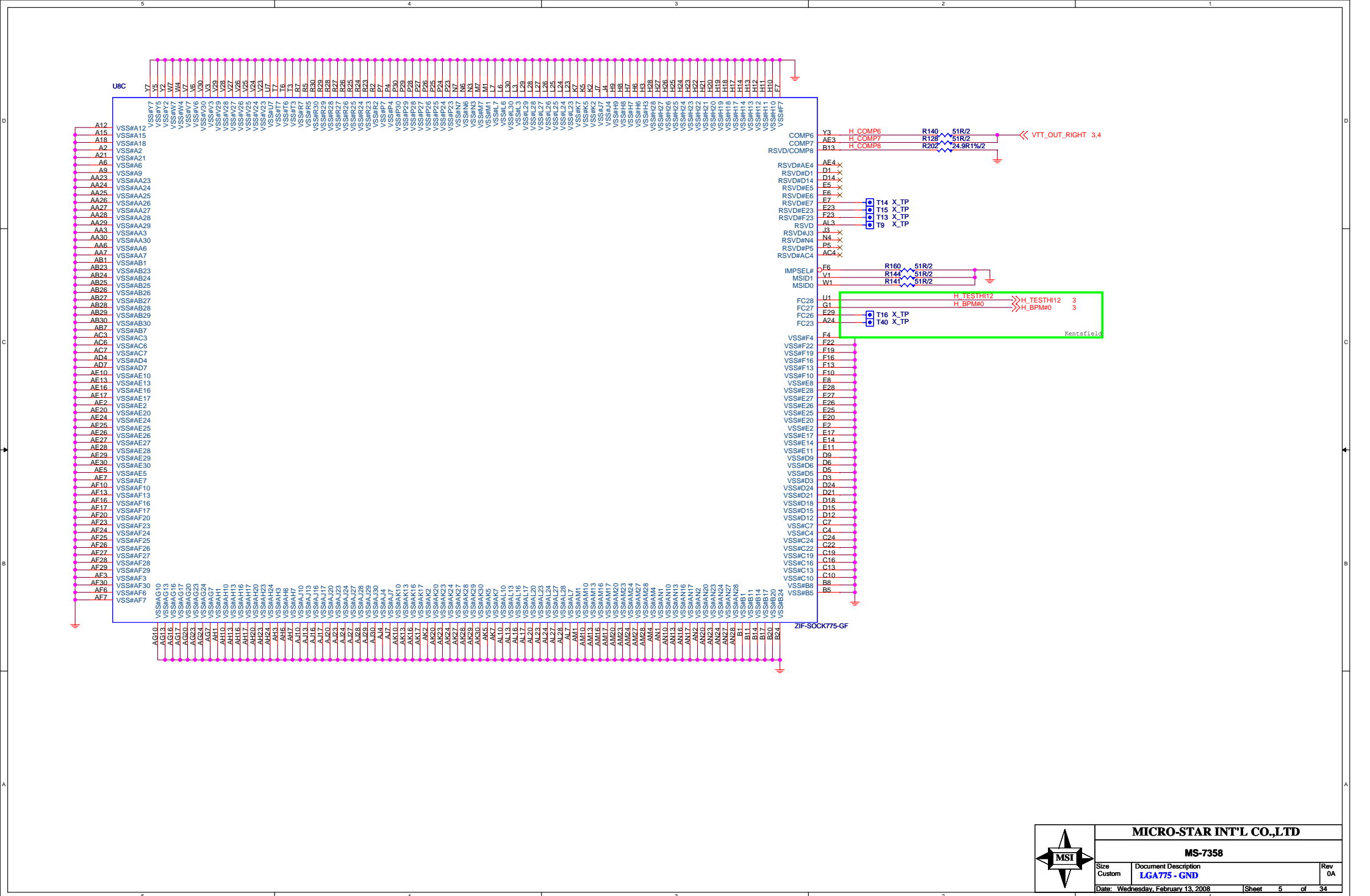
Single End 50ohm Top/Bottom : 4mils
 USB2.0 - 90ohm : 15/4.5/7.5/4.5/15
 SATA - 95ohm : 15/4/8/4/15
 LAN - 100ohm : 15/4/8/4/15
 PCIE - 95ohm : 15/4/8/4/15
 IEEE1394 - 110ohm : 15/4/9/4/15
 IDE : 15/4/8/4/15

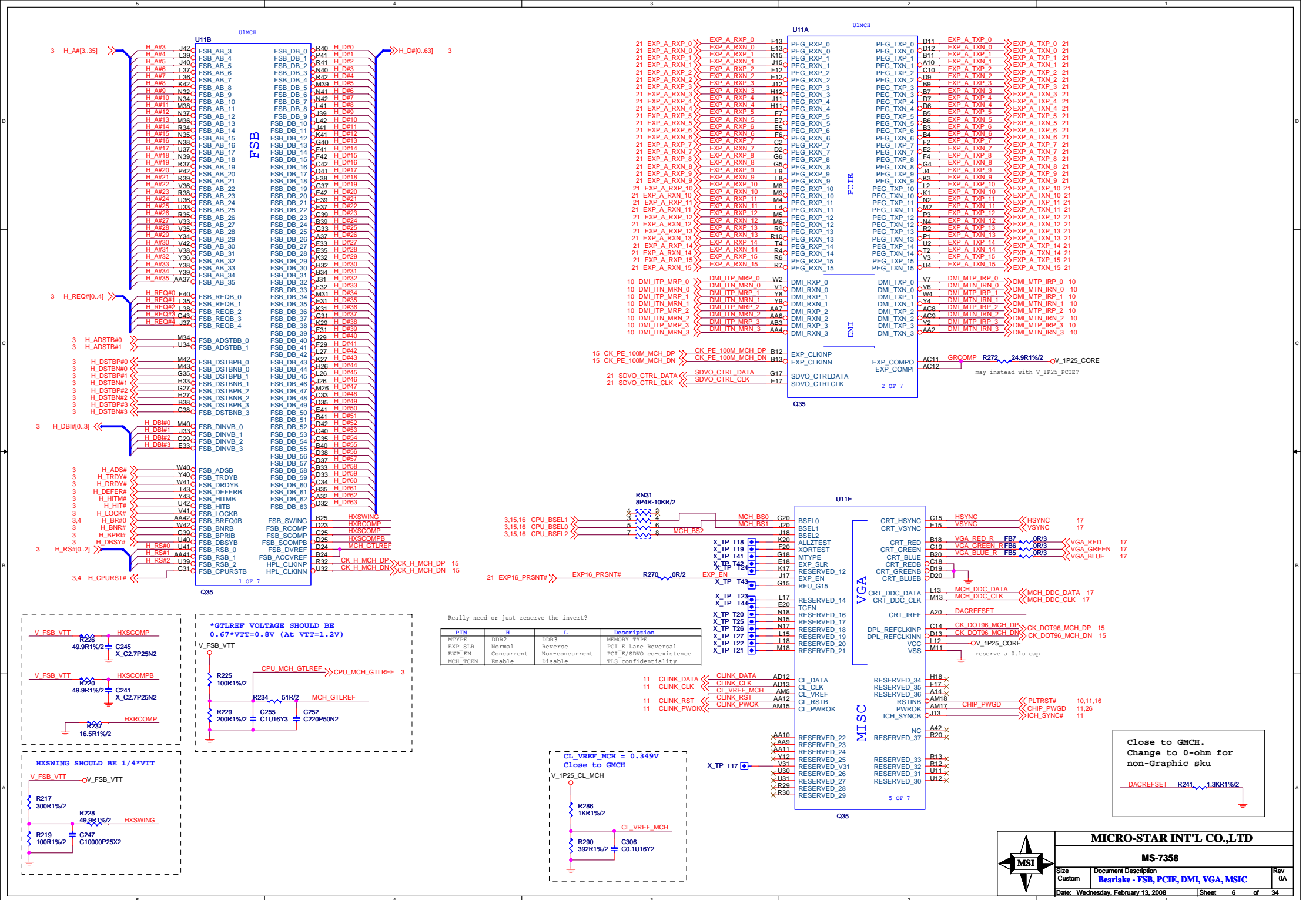
CPU SIGNAL BLOCK



PULL HIGHT PULL DOWN





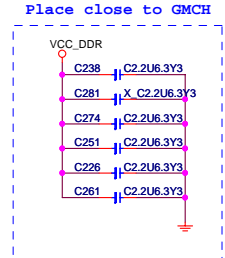
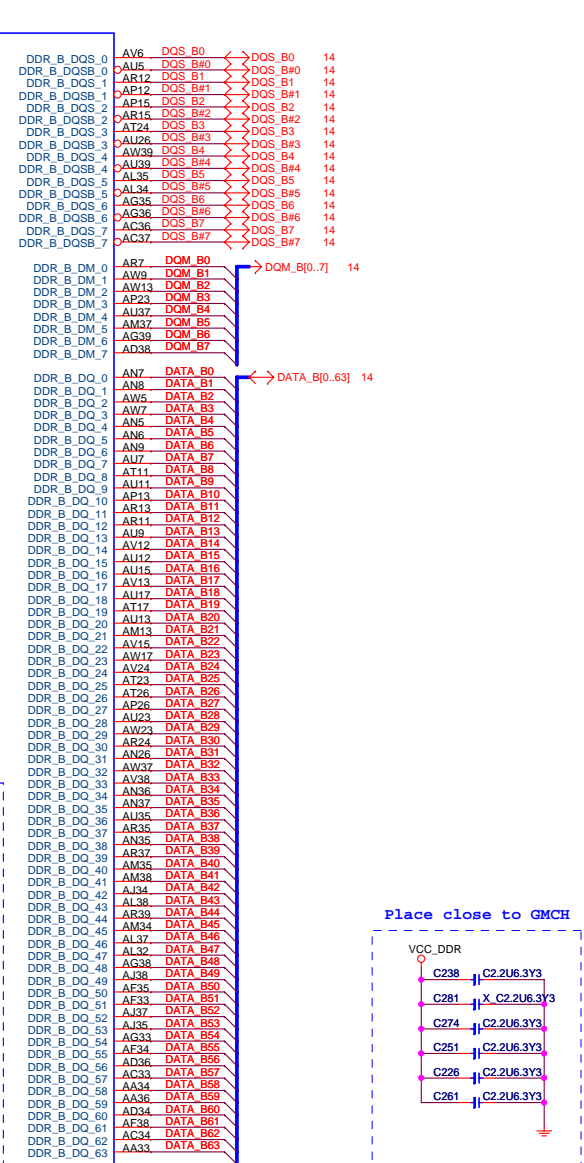
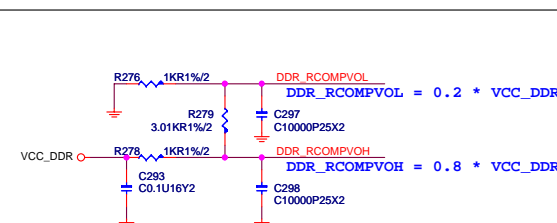
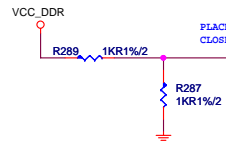
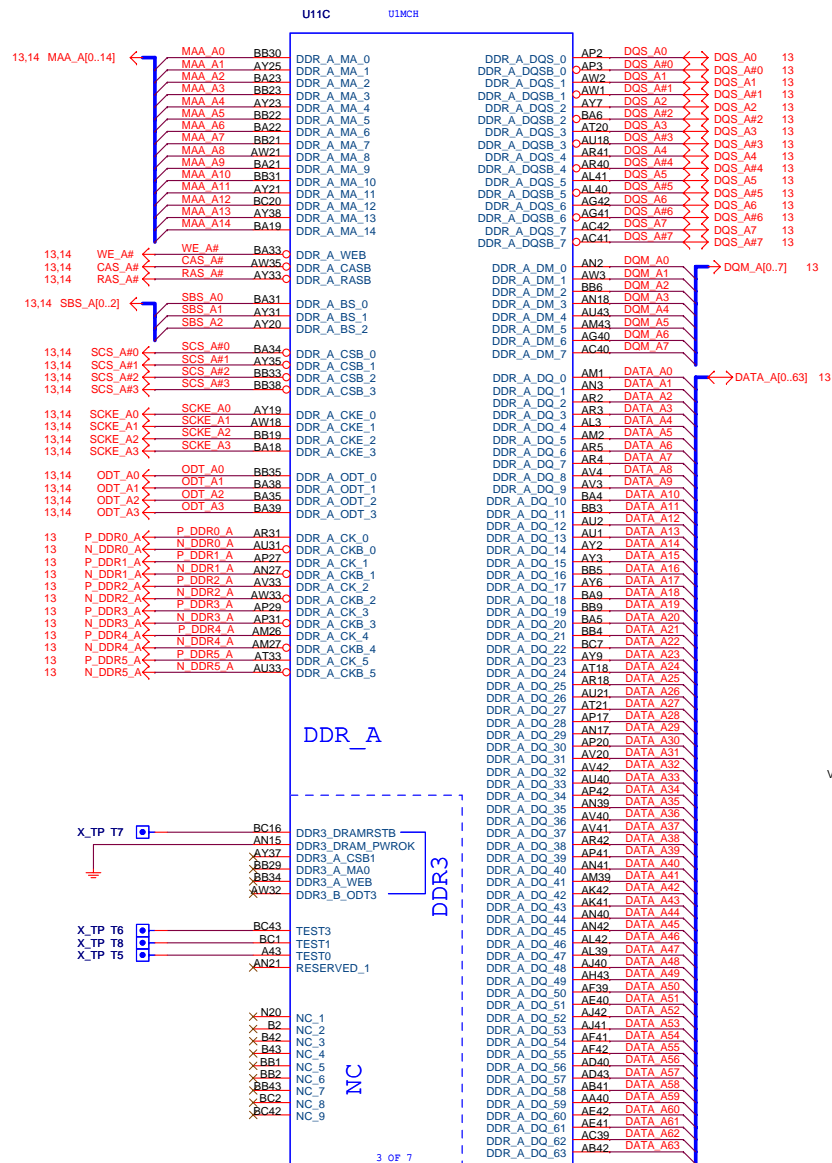


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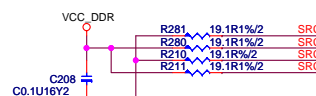
MS-7358

Size	Document Description
Custom	Bearlake - FSB, PCIE, DML, VGA, MSIC

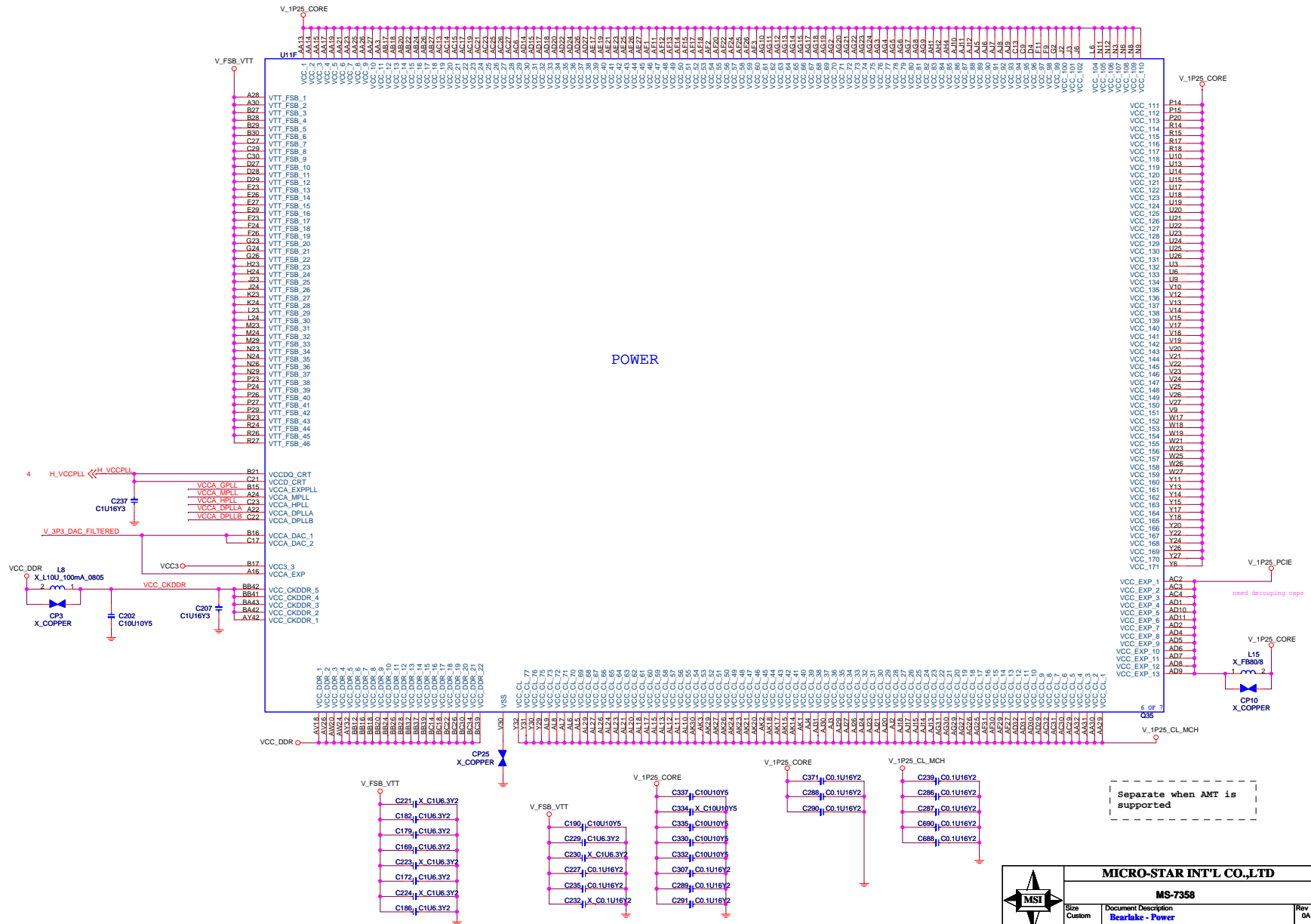
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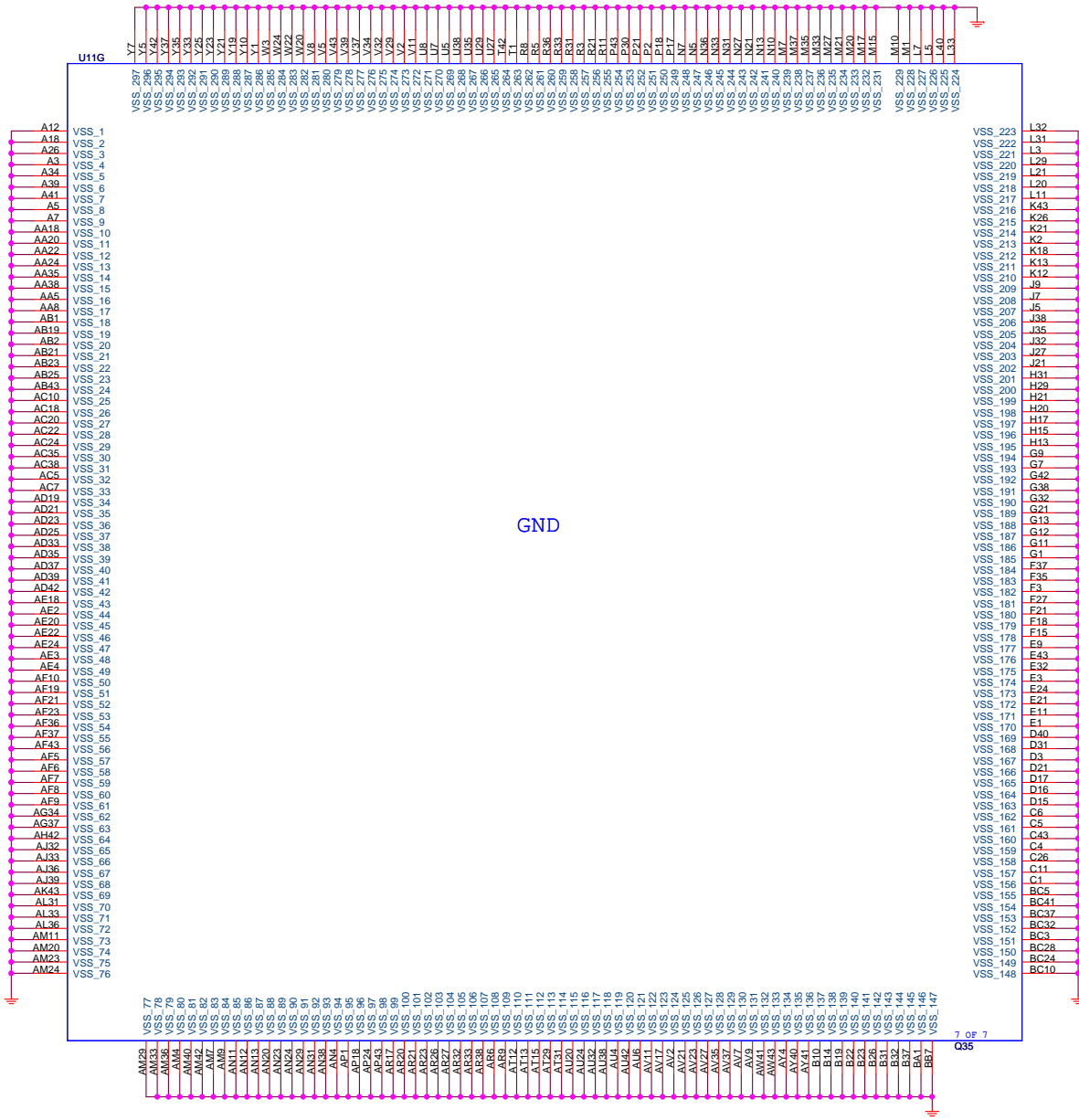
SCROMP1,3 CLOSED TO VCC_DDR

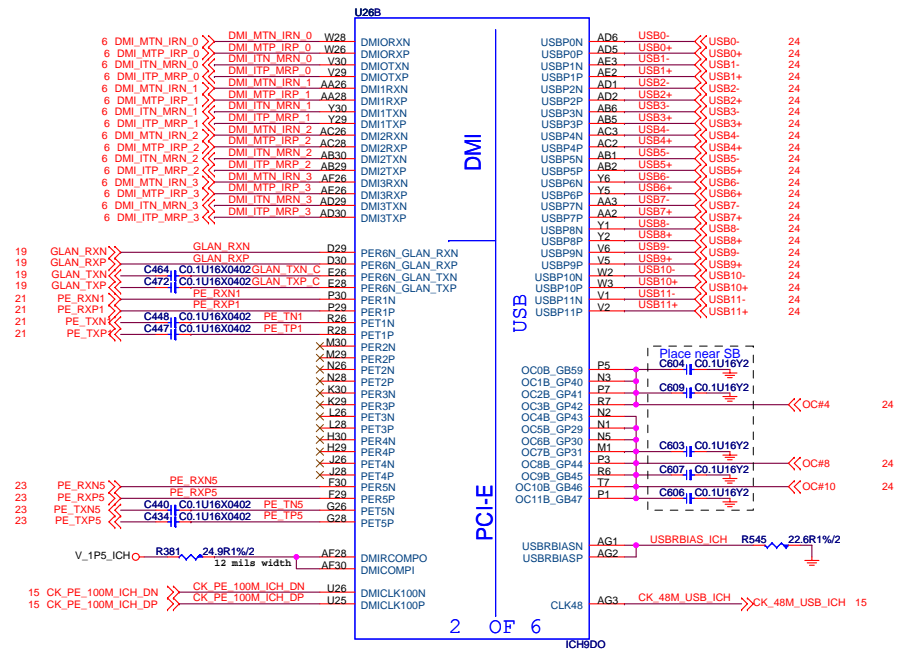
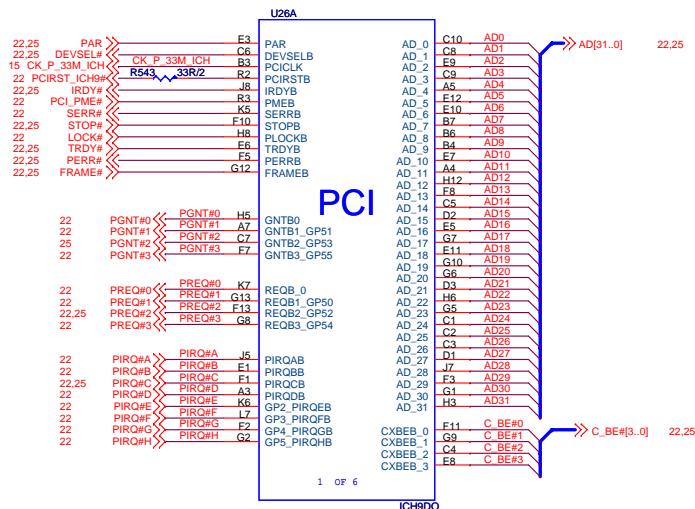


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SB STRAPPING RESISTOR

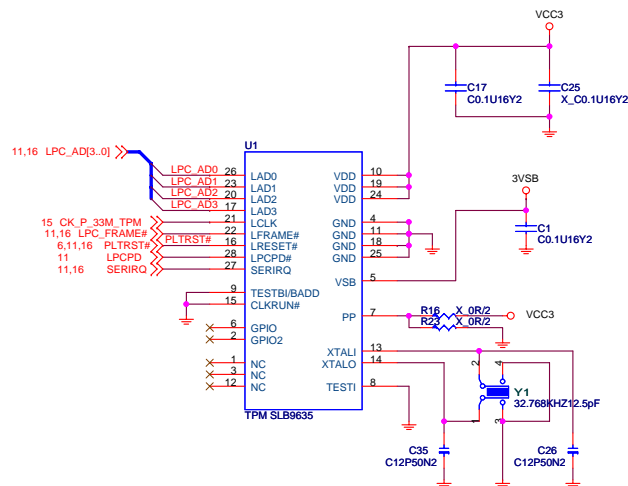


BOOT SELECT STRAPS		
BOOT DEVICE	GNT#0	SPI_CS1#
FWH	1	1
SPI	0	1
PCI	1	0

SIGNAL	H	L	DES.
GNT3	DIS	EN	A16 OVERRIDE
GNT2	N/A	SET BIT	PCI-E PORT CONFIG 2 BIT 0 (5-6)

HDA_SDOUT/HDA_SYNC strap PCI_E port configuration bit[1:0]. Internal weak pull down.
00:1X/1X/1X 11:0X/0X/4X

TPM - Security Controller



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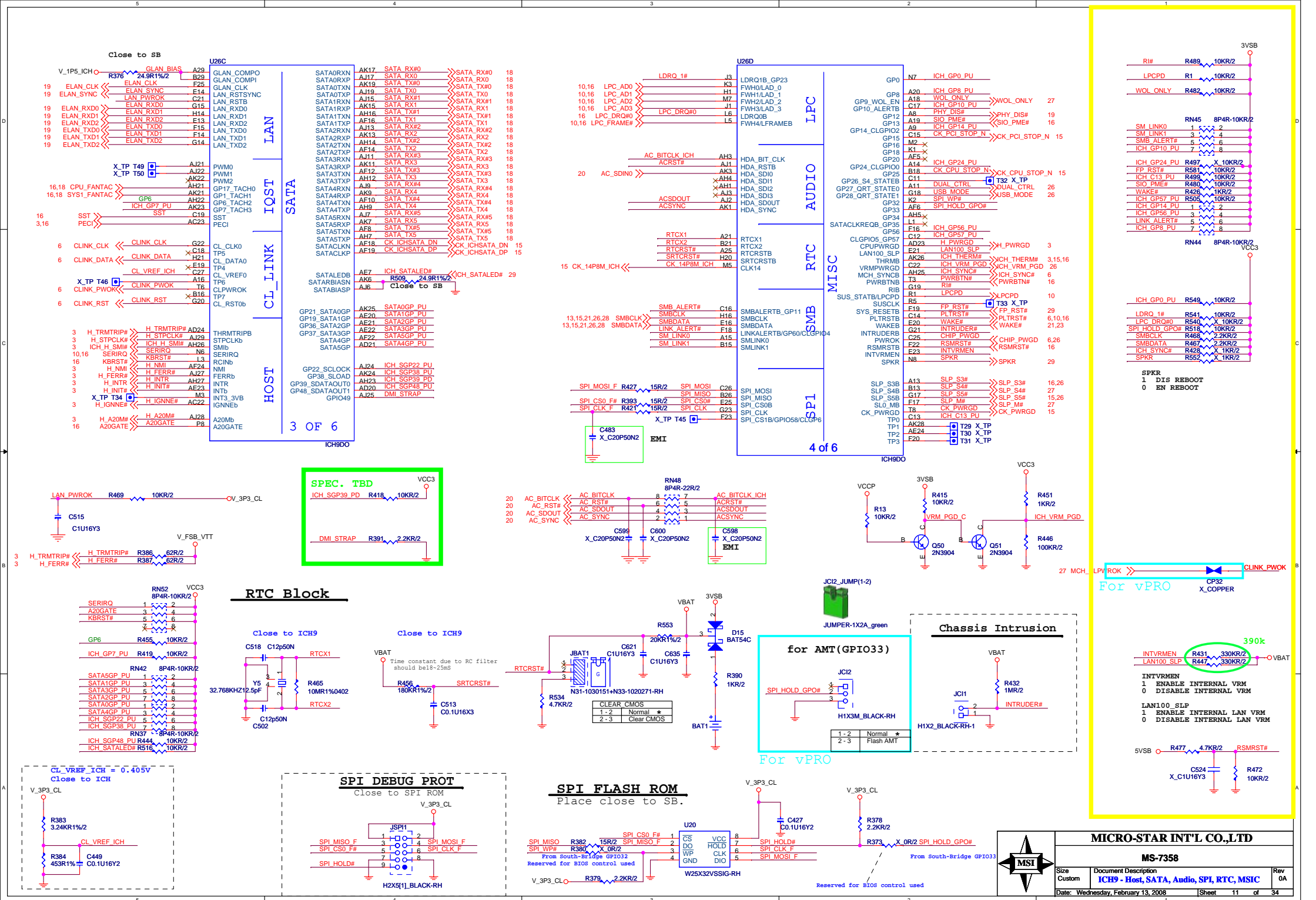
MS-7358

Size Custom

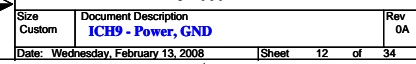
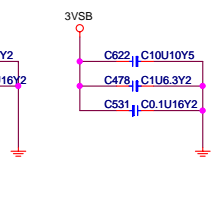
Document Description
ICH9 - PCI, DMI, USB, PCIE & Slots

Rev 0A

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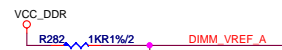


V5REF must be powered up before VCC3 or after VCC3 within 0.7V.
Also, V5REF must power down after VCC3 or before VCC3 within 0.7V.
This rule is also applies to V5REF_SUS and 3VSB.
However, the 3VSB is derived from the 5VSB on the power supply
thru a voltage regulator and therefore, they can satisfy the requirement.





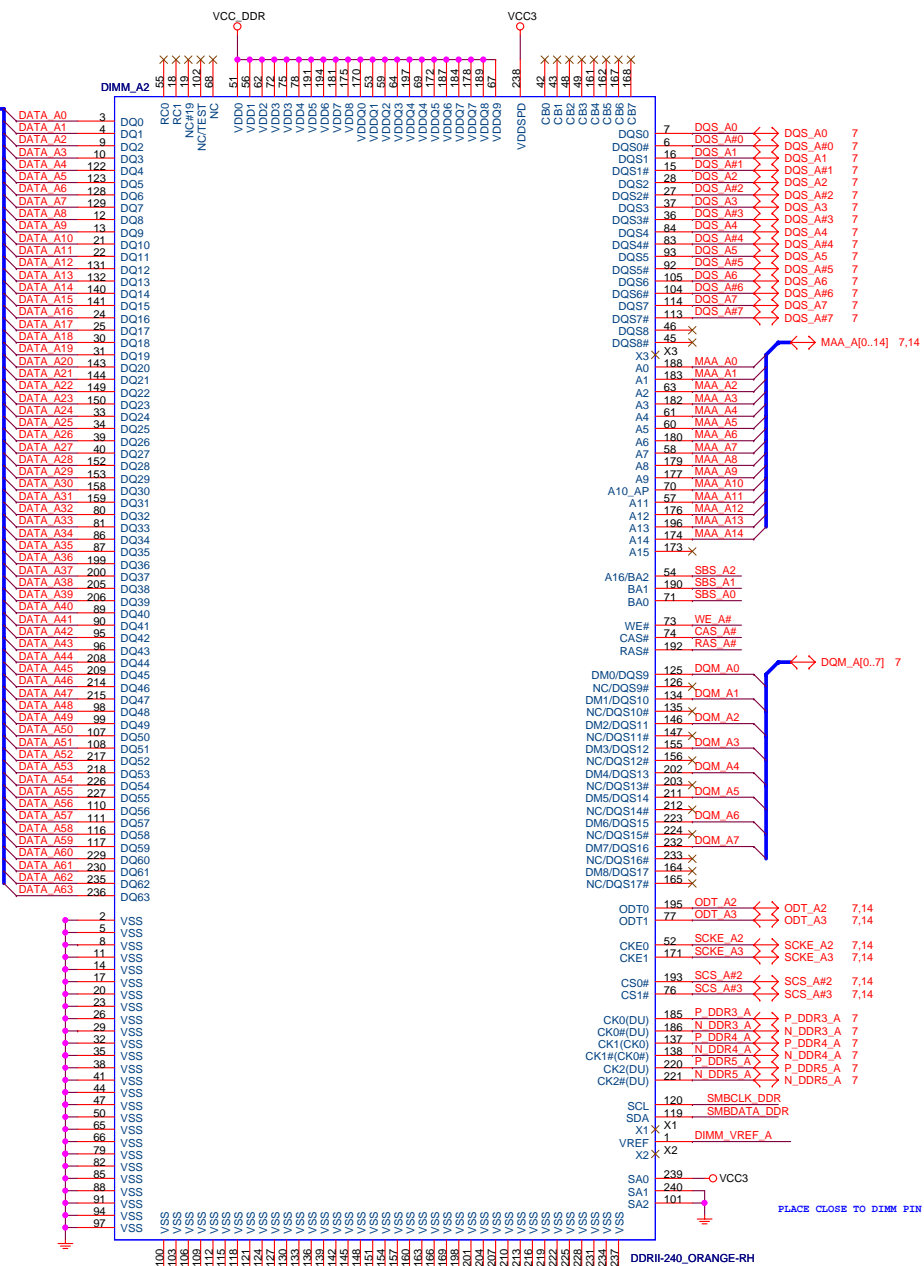
DDRII DIMM_A1



ADDRESS: 000
0xA0


SMBCLK_DDR R76 33R/2
SMBDATA_DDR R80 33R/2

DDRII DIMM_A2



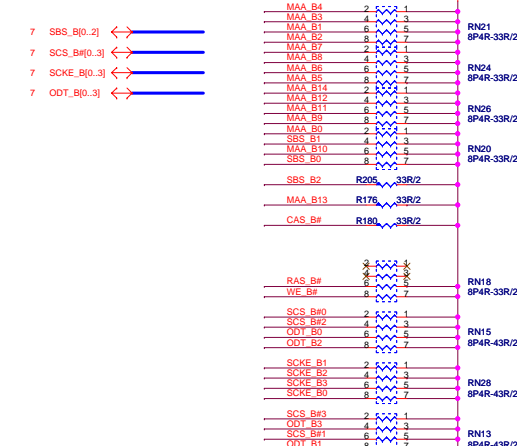
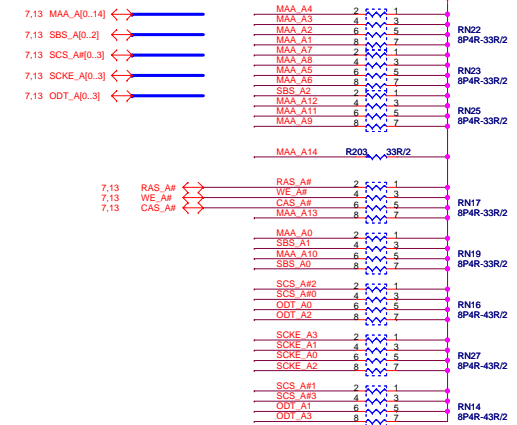
ADDRESS: 001
0xA2

SMBCLK_DDR R76 33R/2
SMBDATA_DDR R80 33R/2

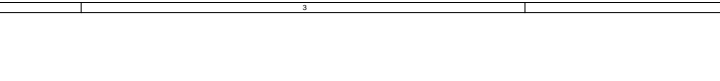
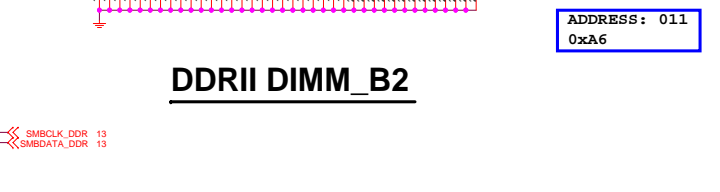
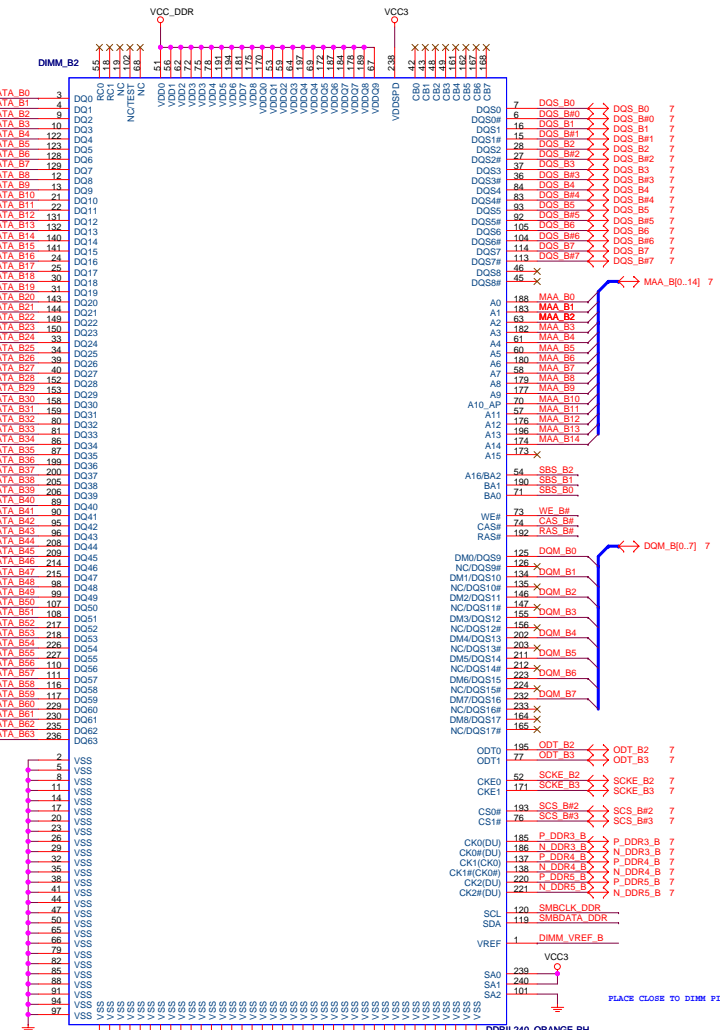
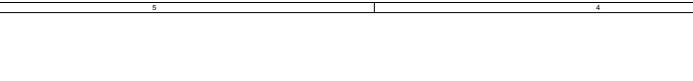
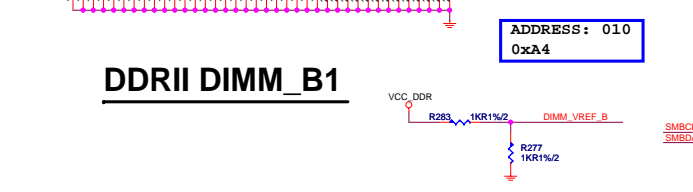
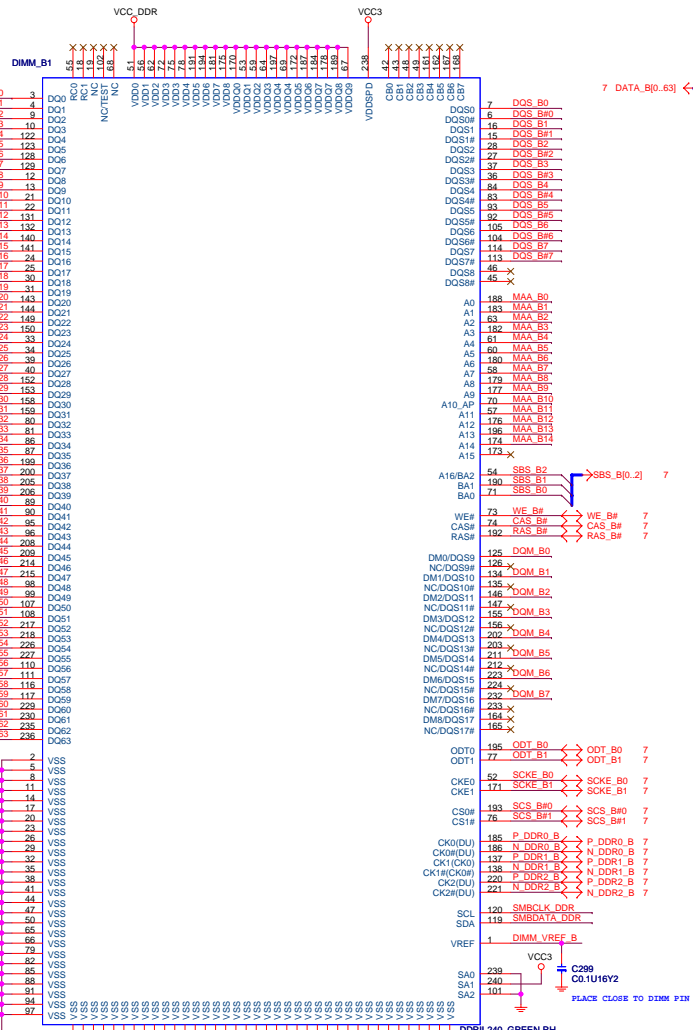


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DDR II Termination



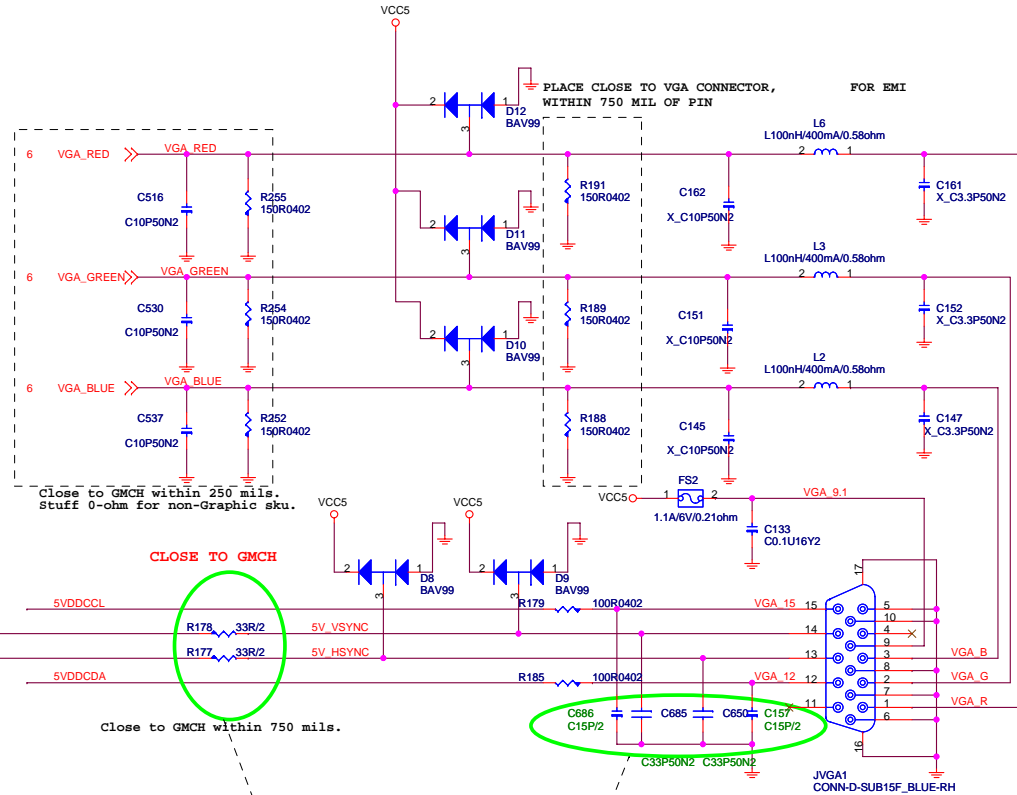
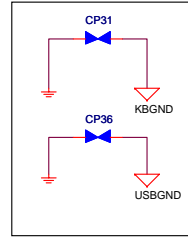
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DDR2 CHANNEL-B/DDR II Termination		
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DDR II DIMM_B2

Video Connector

EMI SOLUTION

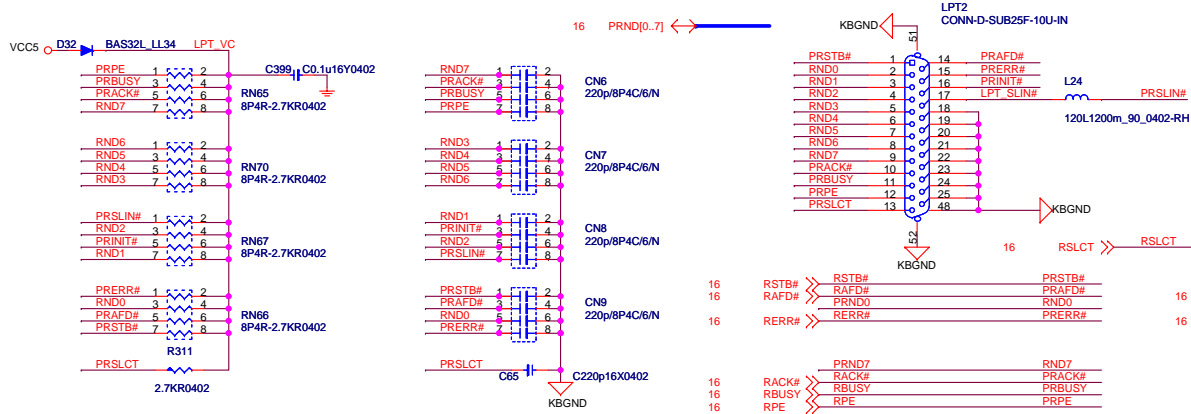


CLOSE TO GMCH

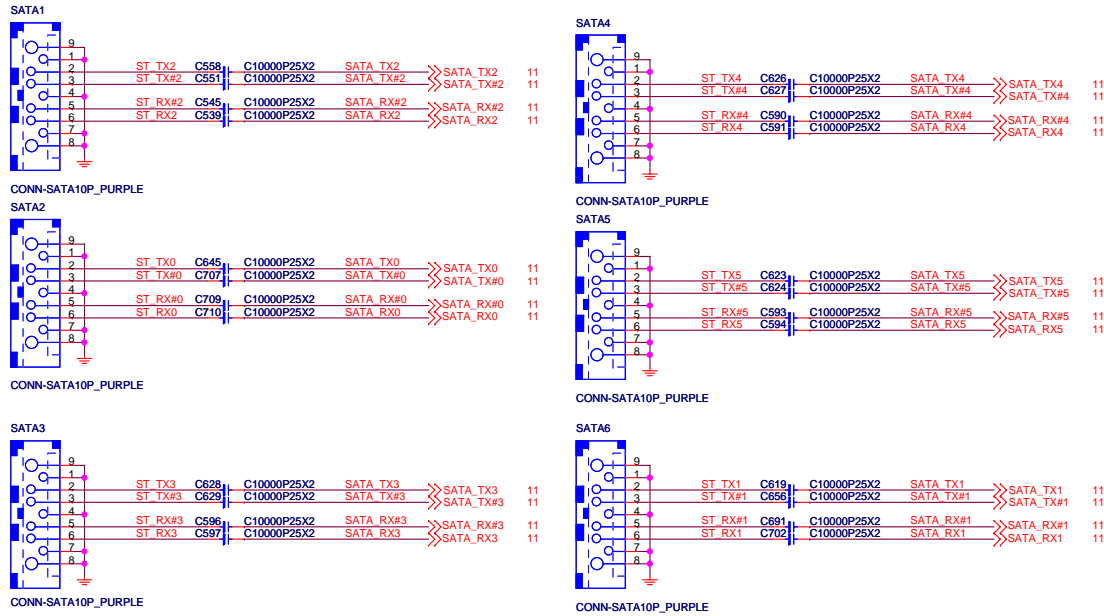
Close to GMCH within 750 mils.

Modify HSYNC/VSYNC Circuit
1. R178, R177 from 30R to 10R
2. CN3 from 33p to 15p
For Rise time edge not clean 07.3.30 by Robile

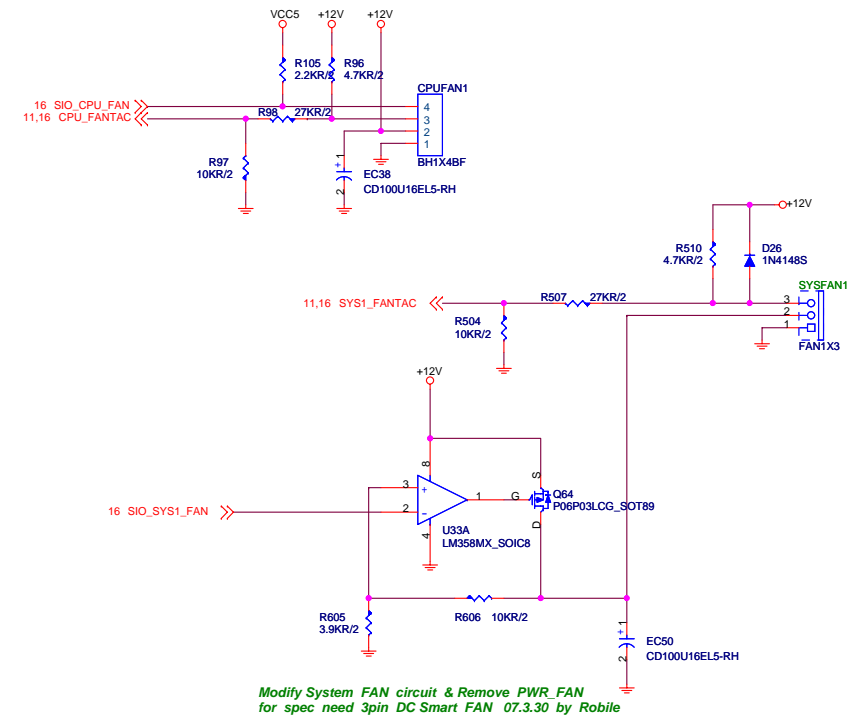
PARALLAL PORT



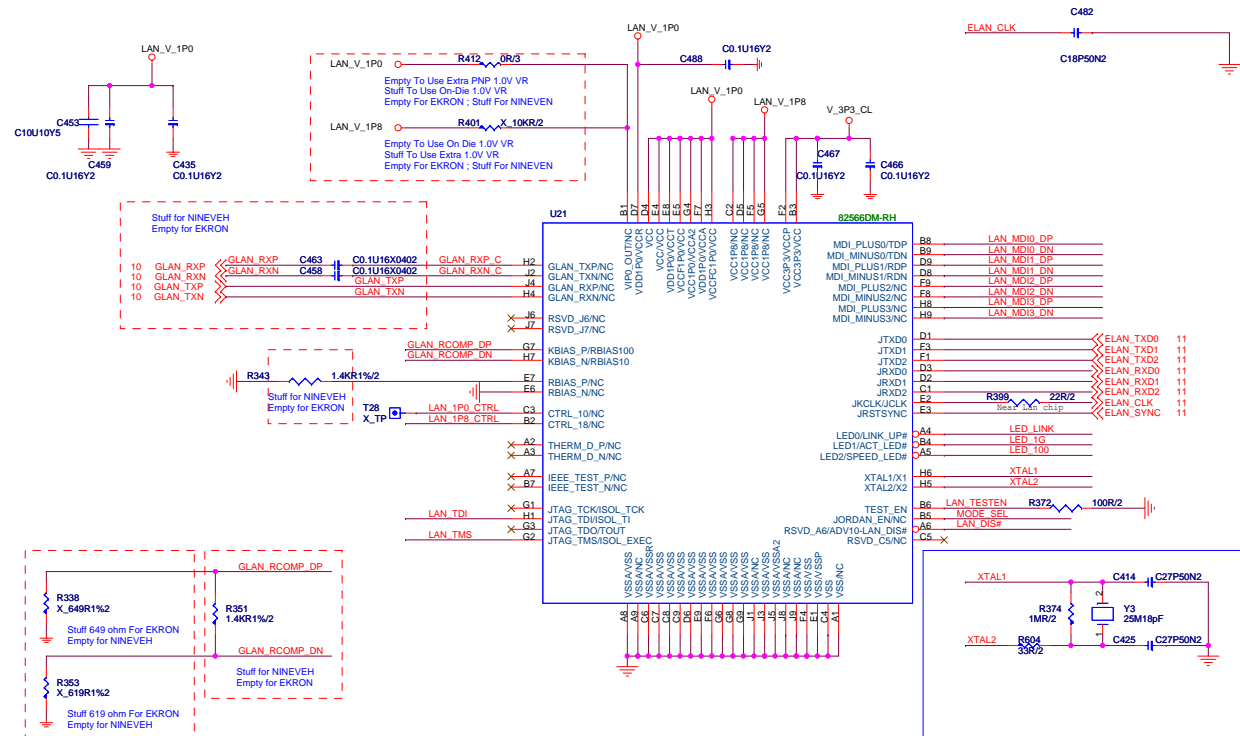
SATA 1- 6 PORT



FAN-COUNTROL CIRCUIT



LAN - NINEVEH/EKRON







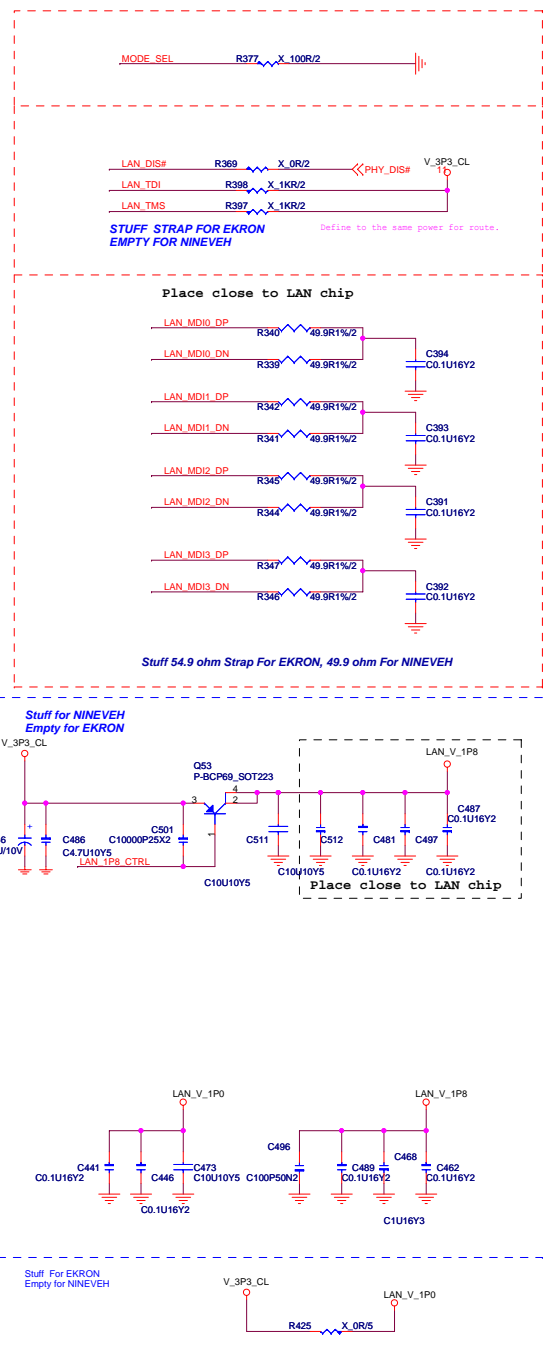
Intel 82566DC
For business desktop PCs.Support Intel AMT2 or ASF 2.0 alerting.Circuit Breaker,WoL,PXE,Multitport teaming,RSS,Intel Stable Image Platform Program drivers.
Intel 82566DC
For consumer desktop PC.Support Digital Home capabilities,WoL,PXE.
B06-82566C-176
Basic for 10Gb Ethernet connection.
B06-82566C-196
_CHIP_LAN,INTEL82566DC,,BGA-81pin,NINEVEH GIGA LAN CHIP(PHY),RoHS COMPLIANCE
B06-8256205-106
_CHIP_LAN,INTEL82562V,,BGA-81pin,NINEVEH GIGA LAN CHIP(PHY),RoHS COMPLIANCE

```
Speed LED Type
1000Mbps : Orange
100Mbps  : Green
10Mbps   : LED off
```

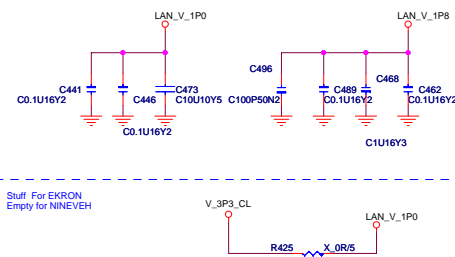
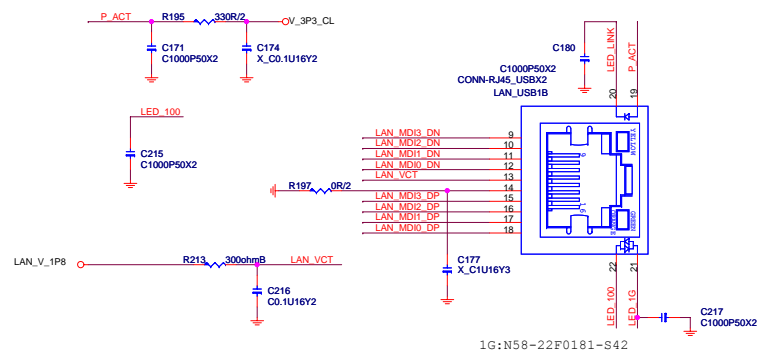
YELLOW : For Active/Link

ACT_LED	Link_LED
S0: LOW	S0: LOW
S1/S3/S4/S5: HIGH	S5: HIGH
	S1/S3/S4: WOL EN-->LOW WOL DIS-->HIGH

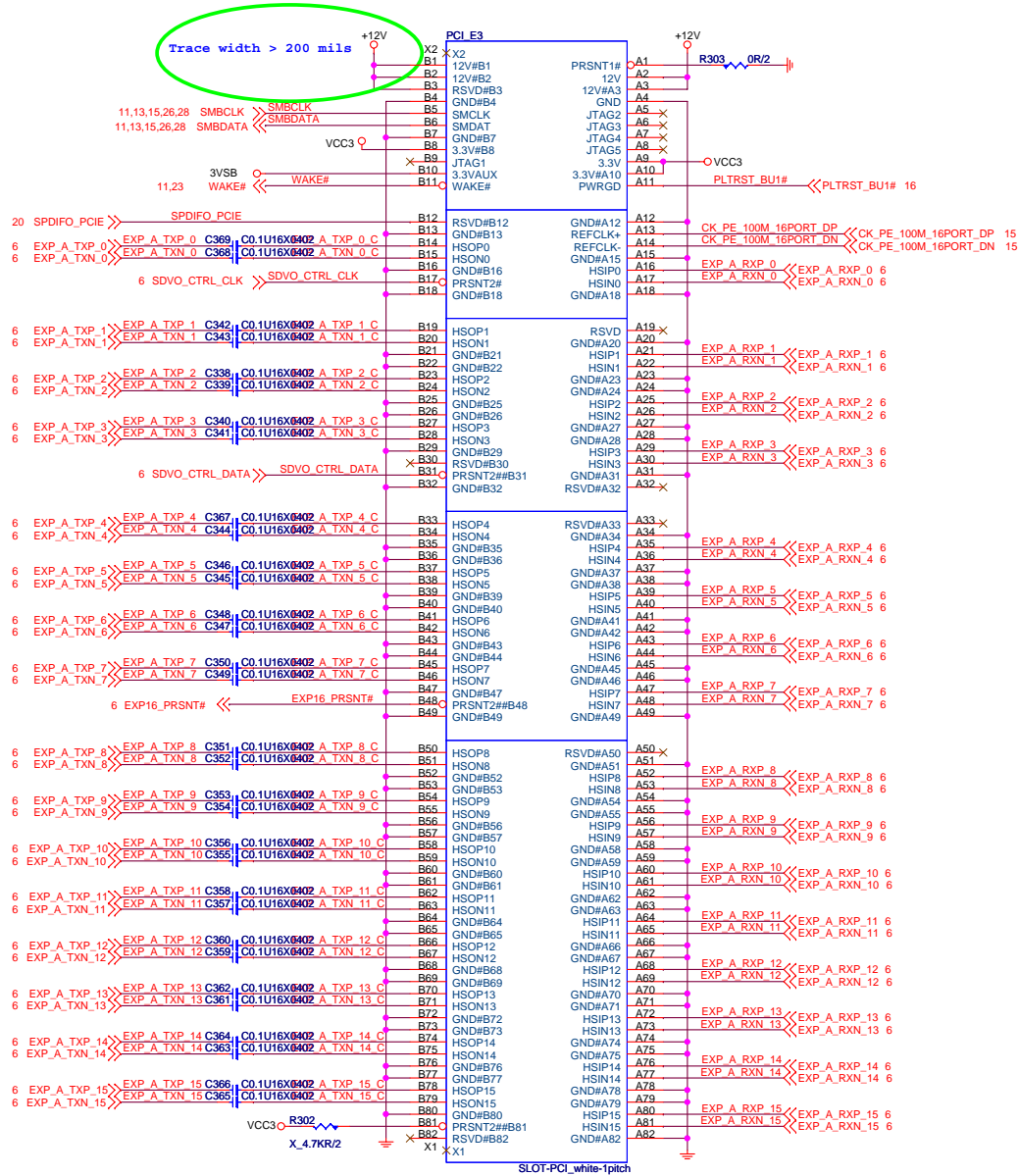
Giga-Lan		10/100-Lan	
N58-22F0181-842		N58-22F0061-84 N58-22F0061-F0	
Link	Yellow	Link	Yellow
Active	Blinking	Active	Blinking
1000	Orange	100	Green
100	Green	10	None
10	None		
19		19	
20	Yellow	20	Yellow
21	Orange	21	
			
22	Green	22	Green



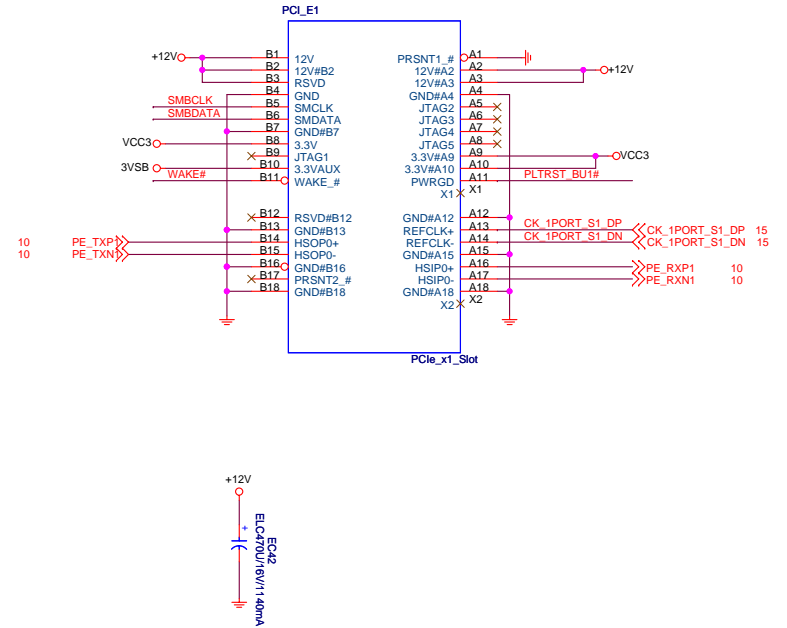
LAN CONNECTOR



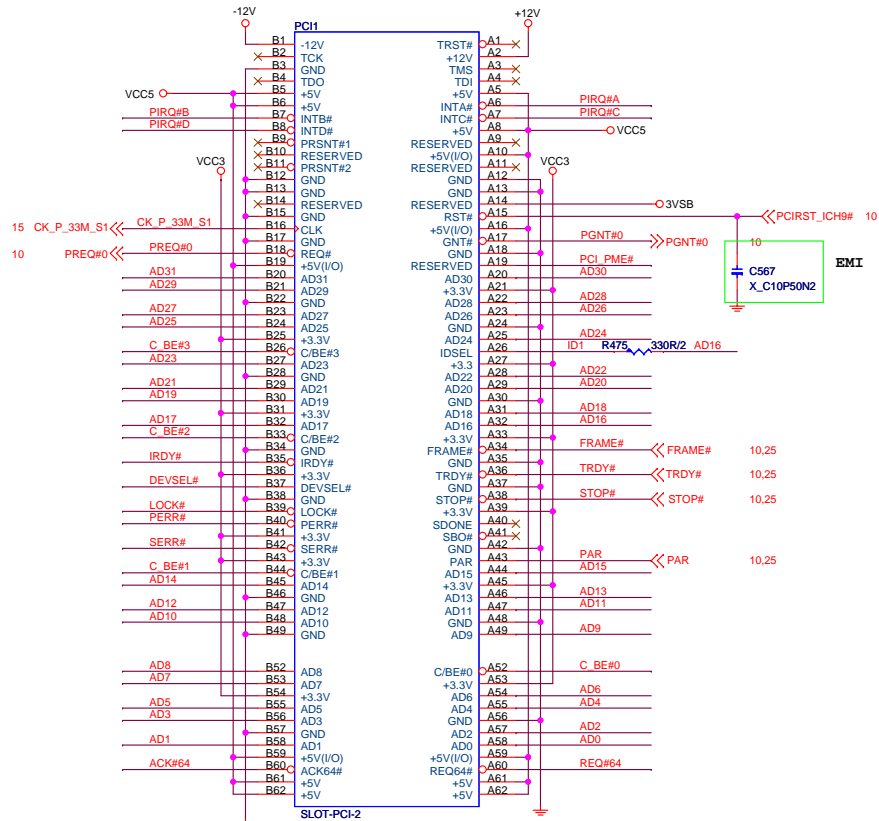
PCI_Express X16 Slot



PCI_Express X4 Slot (Share with PCI_E x1 Slots)



PCI SLOT 1 (PCI VER: 2.2 COMPLY)



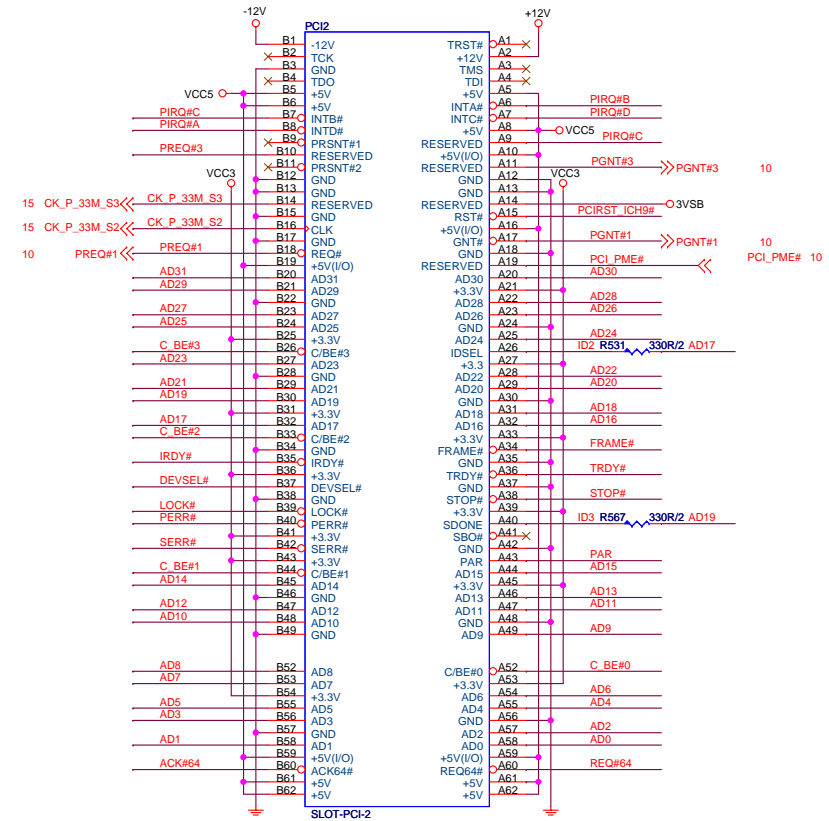
IDSEL = AD16

MASTER = PREQ#0

PIRQ#A

10.25 AD[31..0] << AD[31..0]
10.25 C_BE#[3..0] << C_BE#[3..0]

PCI SLOT 2 (PCI VER: 2.2 COMPLY)

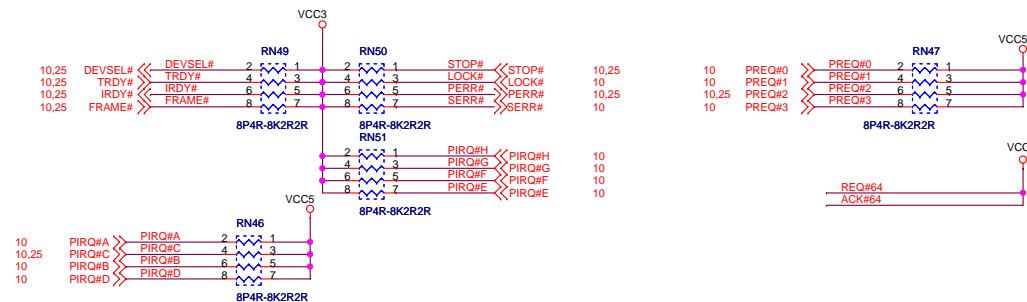


IDSEL = AD17

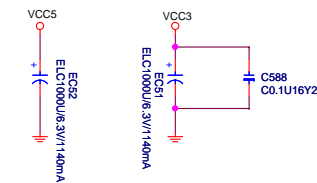
MASTER = PREQ#1

PIRQ#B

PCI PULL-UP / DOWN RESISTORS



PCI SLOT DECOUPLING CAPACITORS

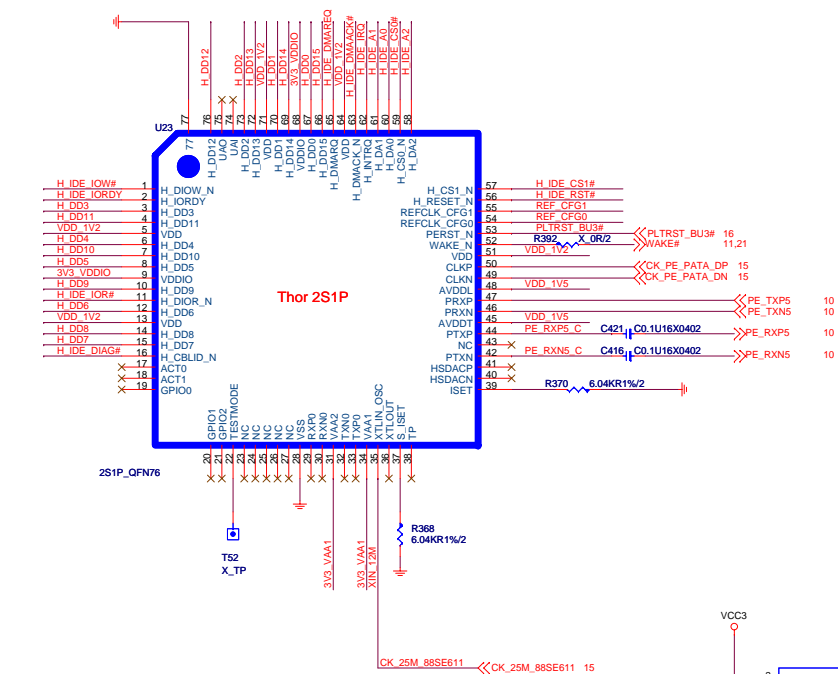


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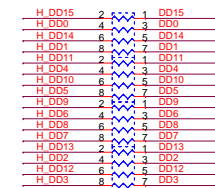
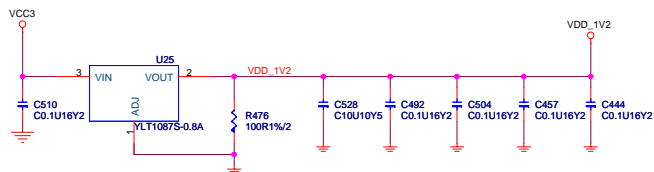
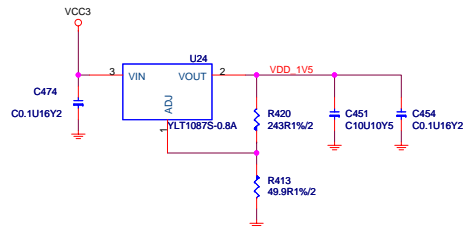
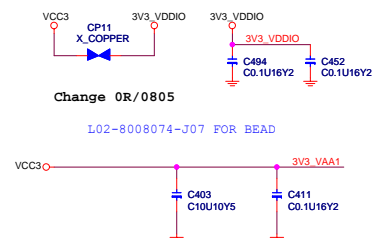
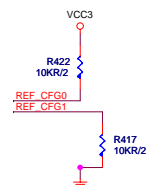
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Hi-Speed PCIE to SATA/PATA Bridge



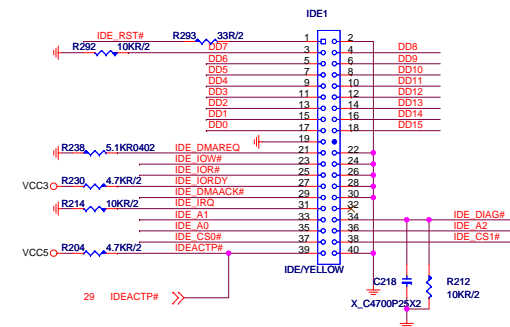
```
REF_CFG[1:0] =  
00:20MHz  
01:25MHz
```



RN43	8P4R-33R/2
RN38	8P4R-33R/2
RN36	8P4R-33R/2
RN41	8P4R-33R/2

H IDE IOW#	R423	22R/2	IDE IOW#
H IDE IOR#	R385	22R/2	IDE IOR#
H IDE A2	R433	22R/2	IDE A2
H IDE A1	R449	22R/2	IDE A1
H IDE A0	R429	22R/2	IDE A0
H IDE DMAACK#	R464	22R/2	IDE DMAACK#
H IDE CS0#	R434	22R/2	IDE CS0#
H IDE CS1#	R414	22R/2	IDE CS1#
H IDE RST#	R450	22R/2	IDE RST#

H IDE DMAREQ	R466	82.5R1%/2	IDE DMAREQ
H IDE_IORDY	R416	82.5R1%/2	IDE_IORDY
H IDE_IRQ	R448	82.5R1%/2	IDE_IRQ
H IDE_DIAG#	R371	82.5R1%/2	IDE_DIAG#



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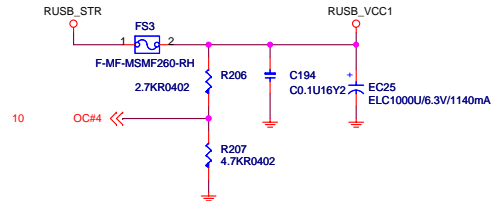
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Size Custom	Document Description Marvell 88SE6111 PCIE to PATA/SATA	Rev 0A
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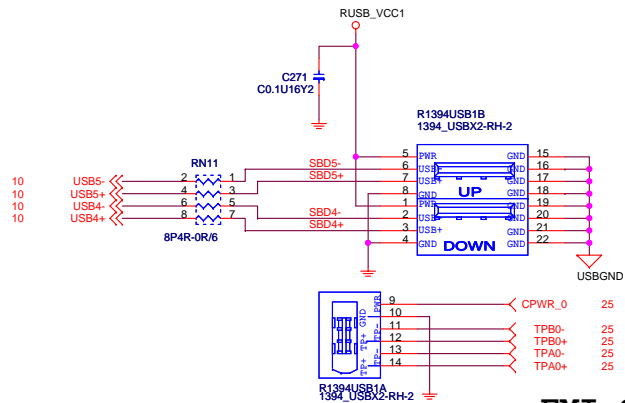
Rear USB Connector

USB POWER FOR PORT 1,2,3,4

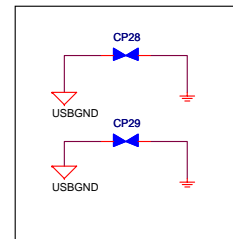
NEAR CONNECTOR



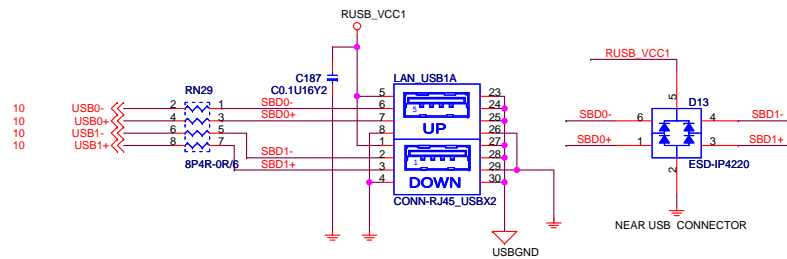
REAR USB PORT 0,1 (1394)



EMI SOLUTION



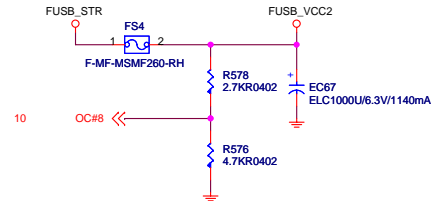
REAR USB PORT 4,5 (With LAN)



Front USB Connector

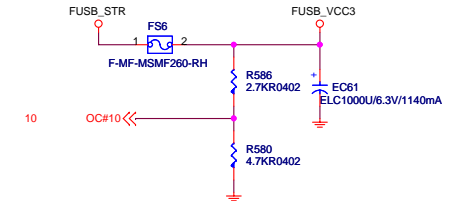
USB POWER FOR PORT 7,8,11,12

NEAR CONNECTOR

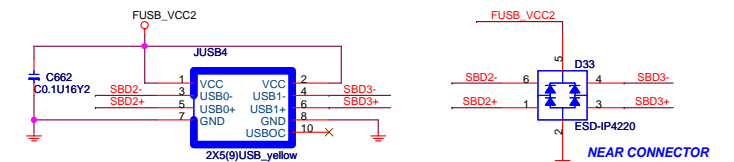


USB POWER FOR PORT 5,6,9,10

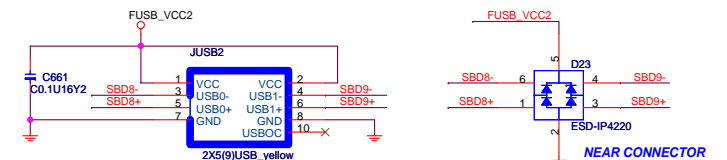
NEAR CONNECTOR



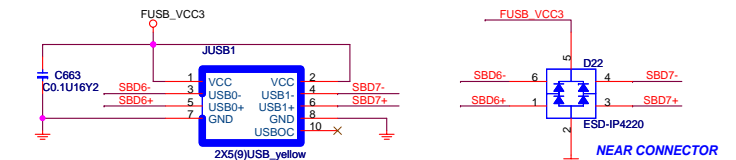
FRONT USB PORT 8,9



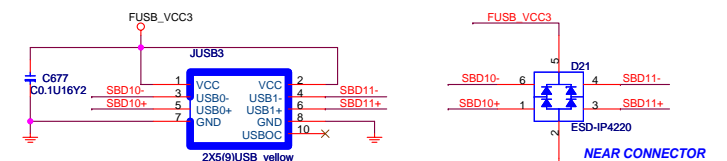
FRONT USB PORT 8,9



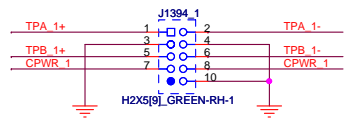
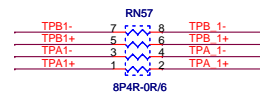
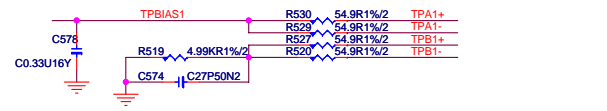
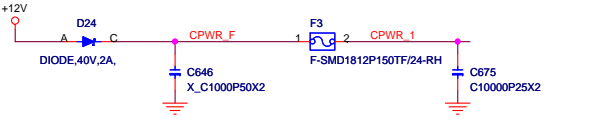
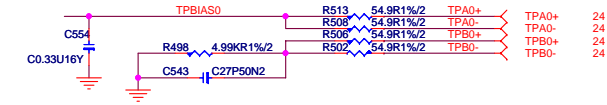
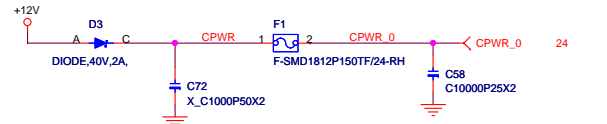
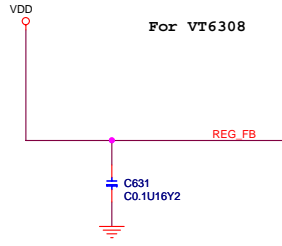
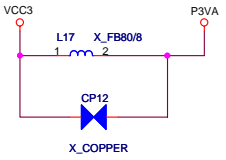
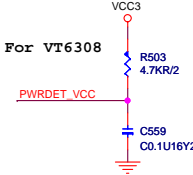
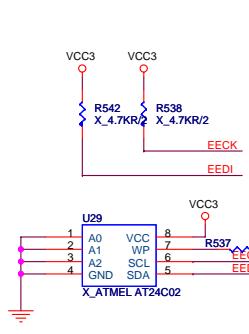
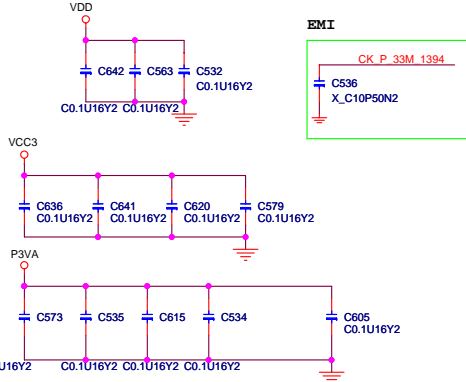
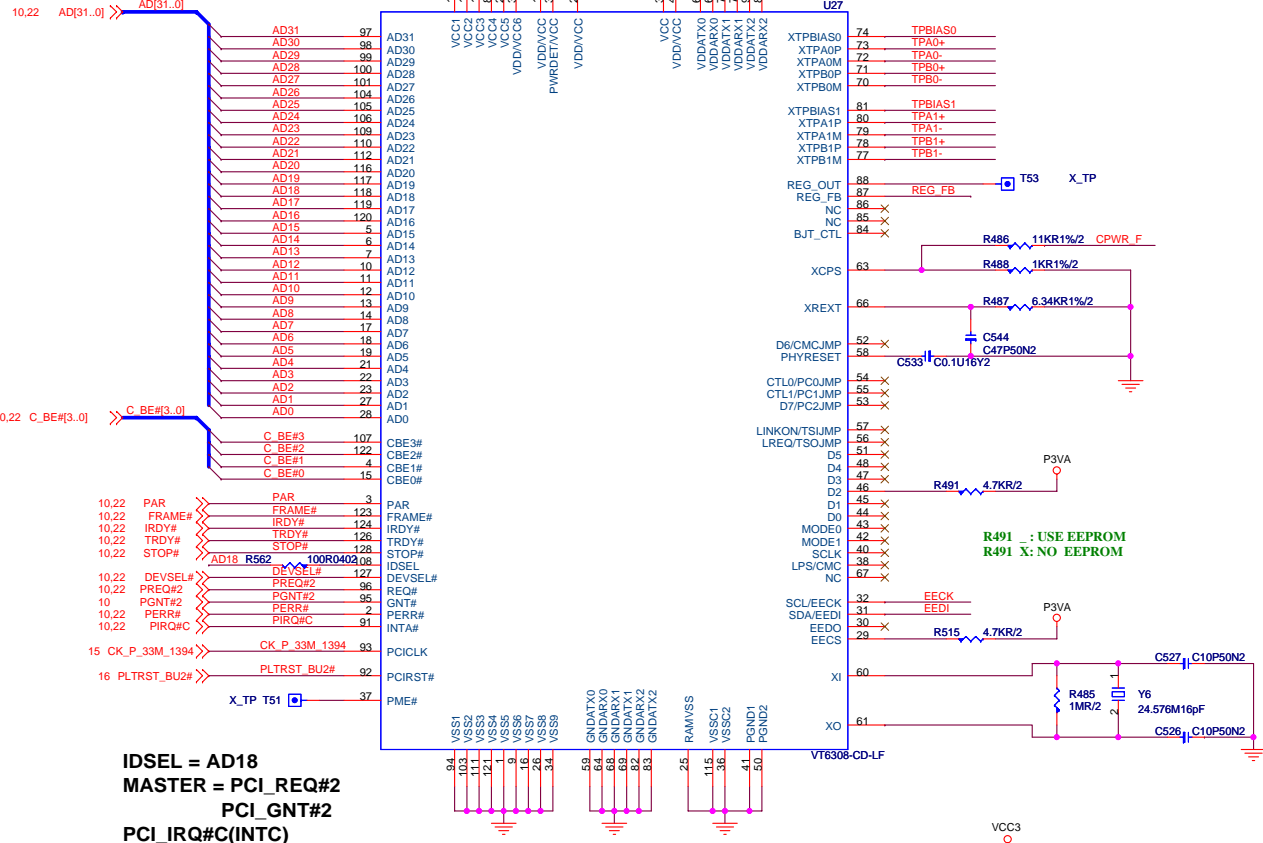
FRONT USB PORT 6,7



FRONT USB PORT 10,11

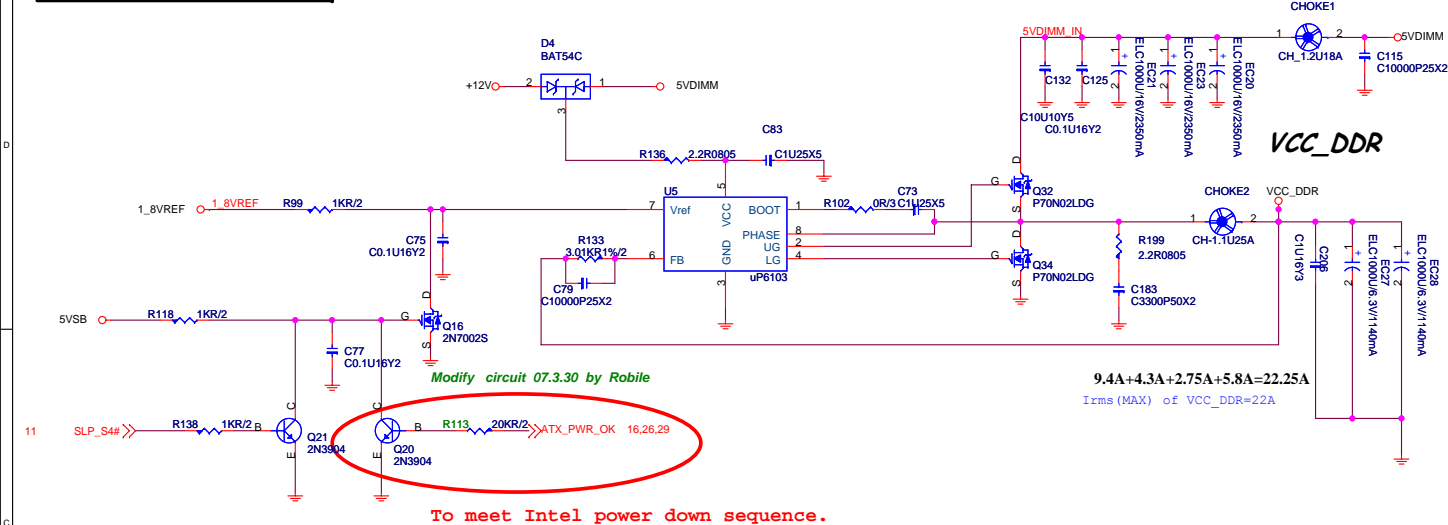


1394a OHCI Link Layer Controller



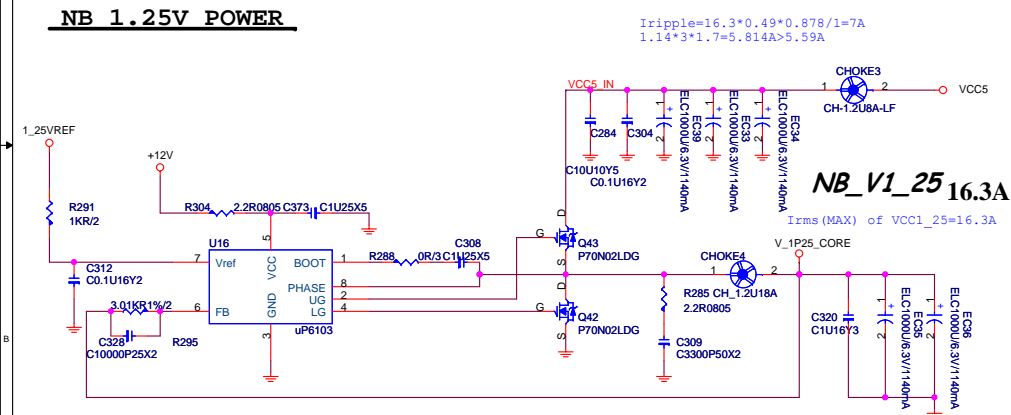
For Intel 1394 pinheader

DDR II 1.8V POWER



To meet Intel power down sequence.

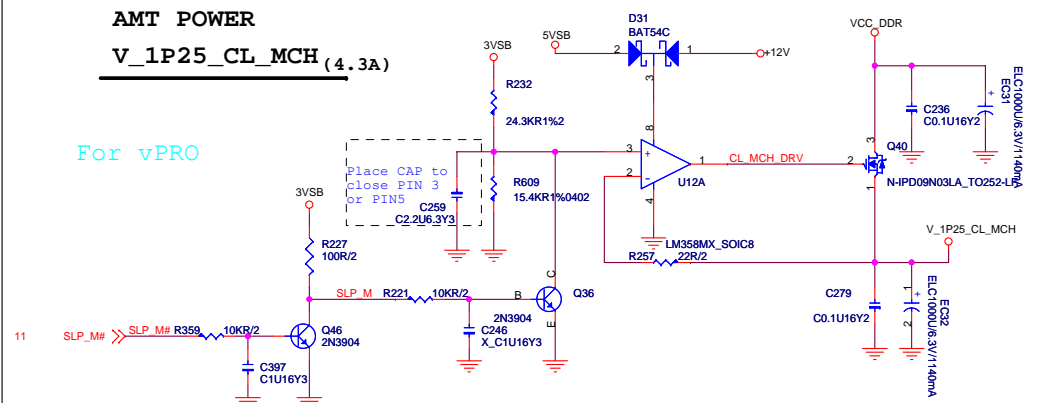
NB 1.25V POWER



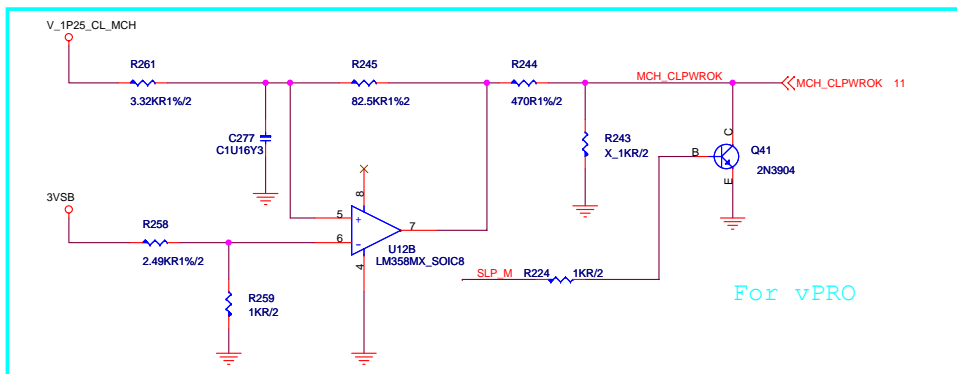
AMT POWER

V_1P25_CL_MCH (4.3A)

For vPRO



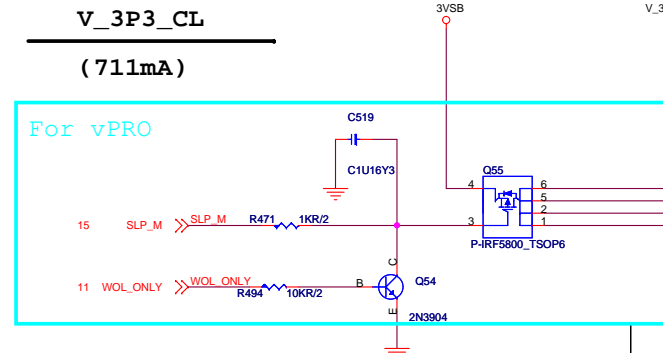
CLINK PWROK GENERATION



V_3P3_CL

(711mA)

For vPRO



For Viiv



~~MICRO-STAR INT'L CO., LTD~~

MS-7358

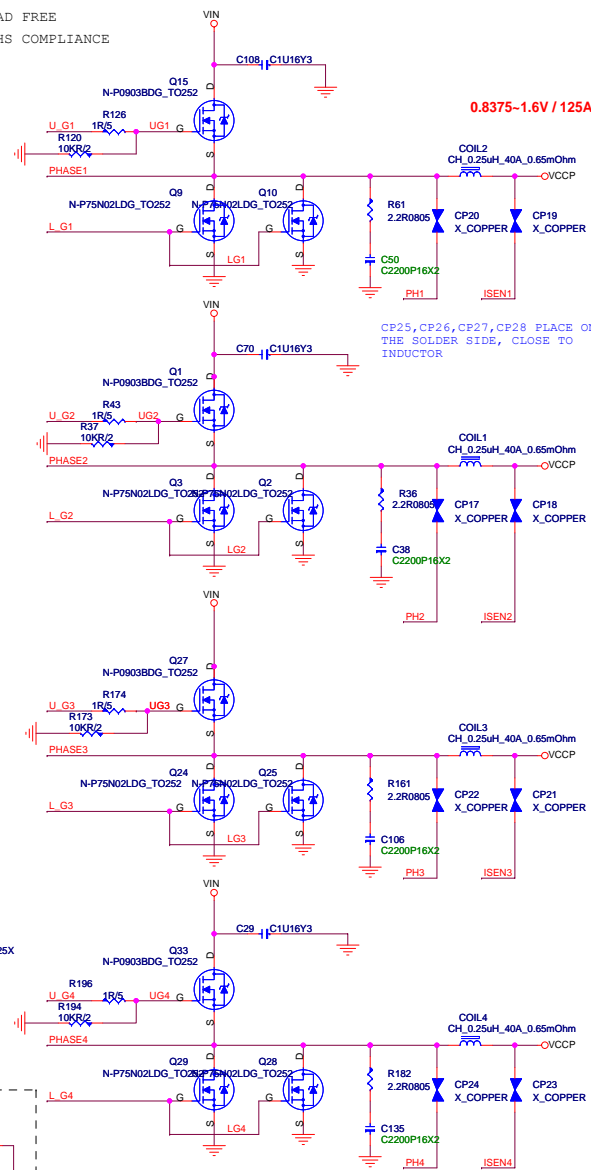
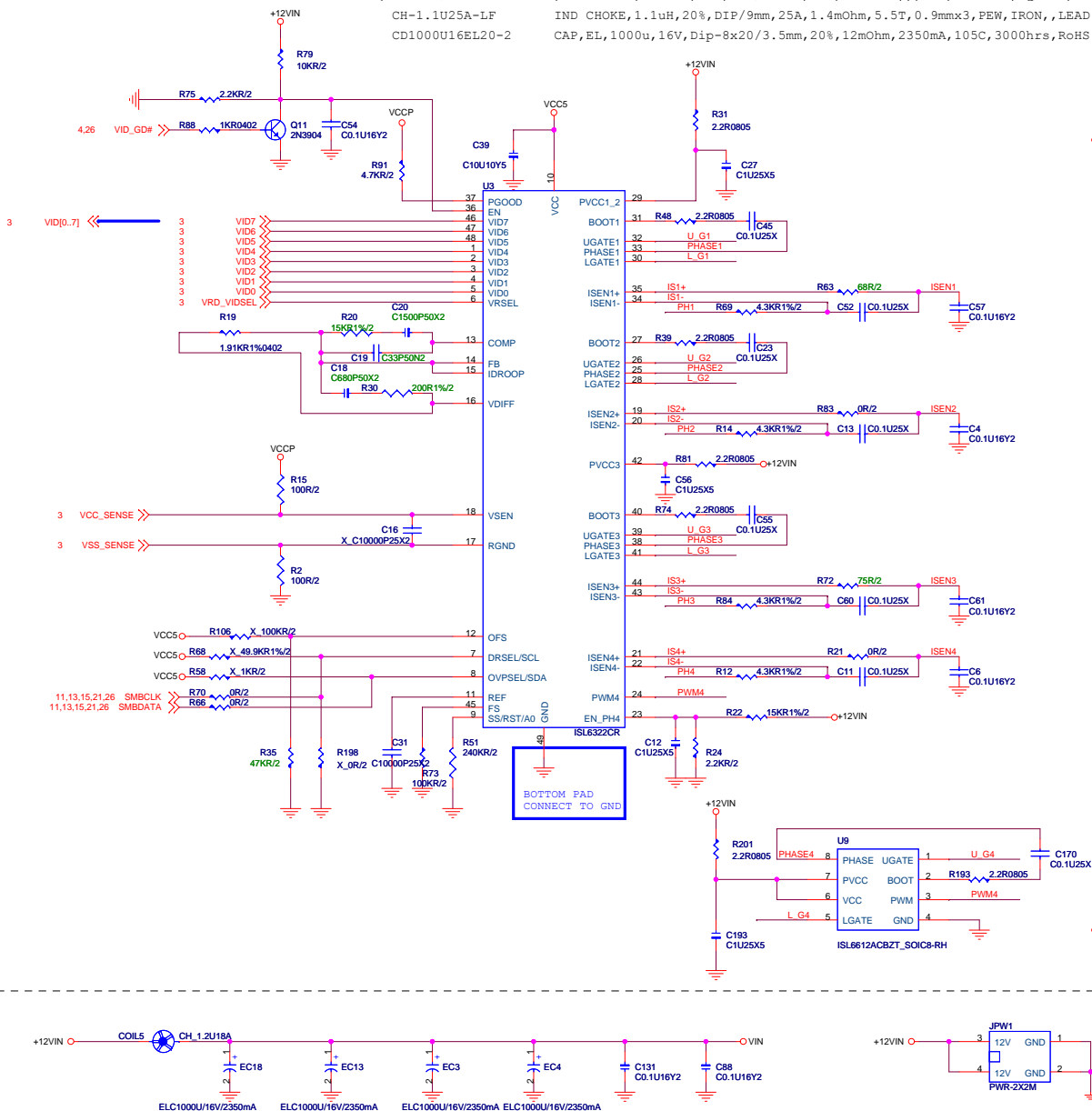
Size Custom	Document Description NB Core Power & DDR Power	Rev 0A
Date: Wednesday, February 13, 2008		Sheet 27 of 34

Voltage Regular Module

N-P0903BDG_TO252
P75N02LDG/TO252
C100U2SP
CD560U4OS-2
1800UF/6.3V
0.25uH/40A
CH-1.1U25A-LF
CD1000U16EL20-2

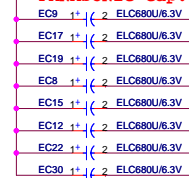
nosfet/n-channel,P0903BDG,SMT/TQ252,Rds(on)=9.5mΩ(10V/25A),Vgs(on)=-1-3V,Id=50A,Ciss=1800pf,Qg=50nC,Vds=25V,Vgs=±20V,RoHS COMPLIANCE
ESR@f=1MHzChannel,P75N02LDG,SMT/TQ252,Rds(on)=7mΩ(⑩10V,30A),Vgs(on)=-1-3V,Id=75A,Ciss=5000pf,Qg=140nC,Vds=25V,Vgs=±20V,RoHS COMPLIANCE
ESR@f=1MHzRipple
CMF;6S-CAN;5600V4B,DIP-2/8*9/3.5mm,ESR<7mohm,Ripplecur.=6100mA,LC.<500uA,SPEC series,RoHS compliance
ESR<12mΩ,Ripplecur<2350mA,105C, longlife change from 2000hrs to 30,000hrs,KZJ series
IND CHOKE,0.25uH,20%,DIP/8.5mm,40A,0.6mOhm,,,PEW,FERRITE,SQUARE,RoHS COMPLIANCE
IND CHOKE,1.1uH,20%,DIP/9mm,25A,1.4mOhm,5.ST,0.9mmx3,PEW,IRON,,LEAD FREE
CAP,EL,100uH,16V,Dip-8x20/3.5mm,20%,12mOhm,2350mA,105C,3000hrs,RoHS COMPLIANCE

VIN



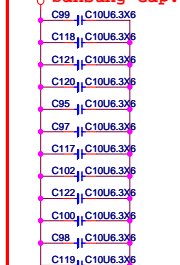
VCCP **680uF EL Capactors**

PANASONIC Cap.



MLCC Inside Socket

VCCP Samsung Cap.



SP Capacitors



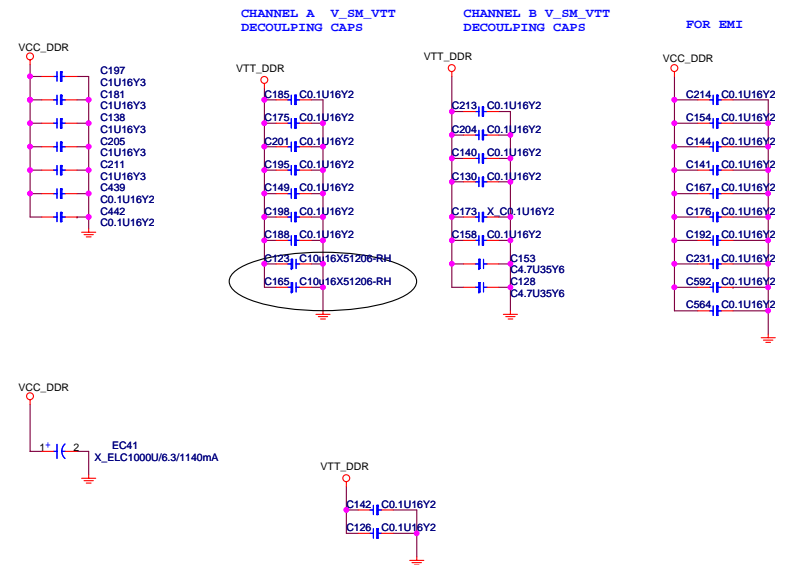
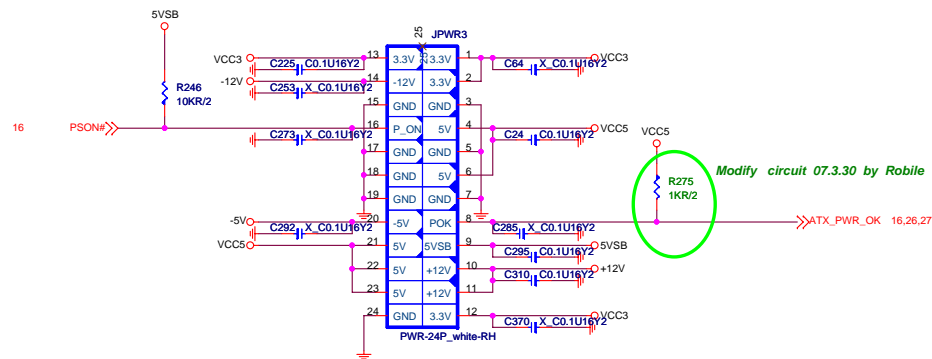
MICRO-STAR INT'L CO.,LTD

MS-7358

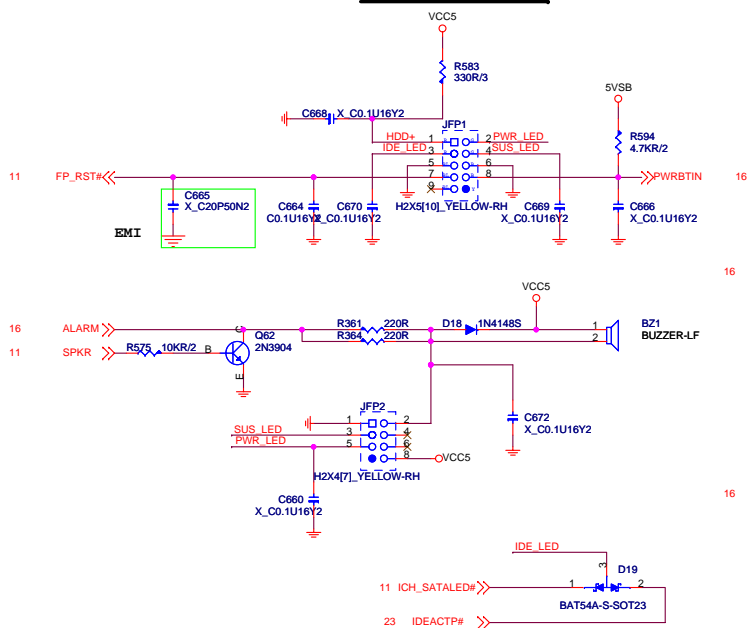
Size	Document Description
Custom	VRD11-ISL6322 4-phase

Date: Wednesday, February 13, 2008 Sheet 28 of 34

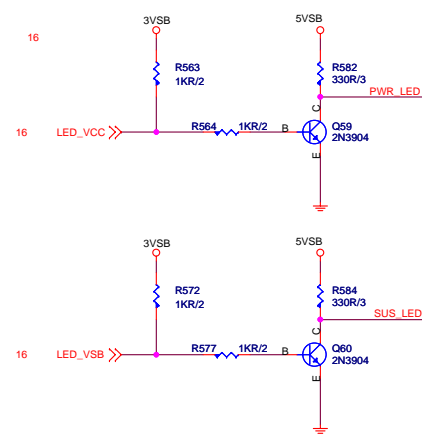
ATX POWER CONNECTOR



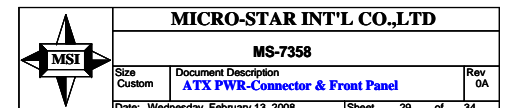
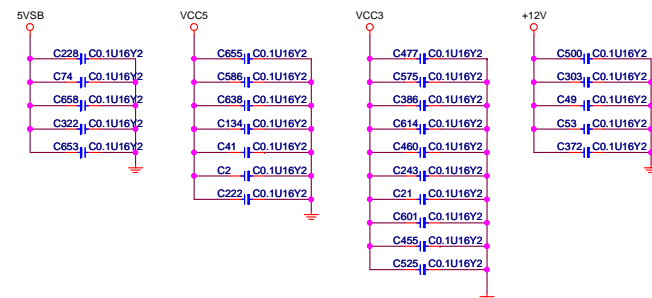
FRONT PANNEL



LED (for Fintek 71882)



Cap. for EMI & Power



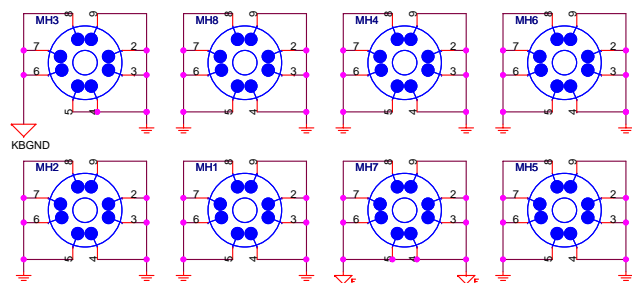
Optical Fiducial Marks-120



Optical Fiducial Marks-100



Mounting Holes



Simulation

