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MS-7359

uATX Version: 10

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

System Chipset:

Intel Bearlake - Q/G/P (G33, P35, Q35/33North Bridge)
Intel ICH9 (South Bridge)

On Board Device:

CLOCK Gen -- ICS 9LPRS900
LPC Super I/O -- Fintek F71882
LAN -- Realtek 8111 (PCIE)
HD Audio Codec -- ADI197
1394 Controller -- VT6308 (Rear x1, Front x1)
PCIE to PATA/SATA Bridge -- Marvel 88SE6111

Main Memory:

Dual-channel DDR-III * 4

Expansion Slots:

PCI EXPRESS X16 SLOT *1

PCI EXPRESS X1 SLOT * 2
PCI SLOT * 1

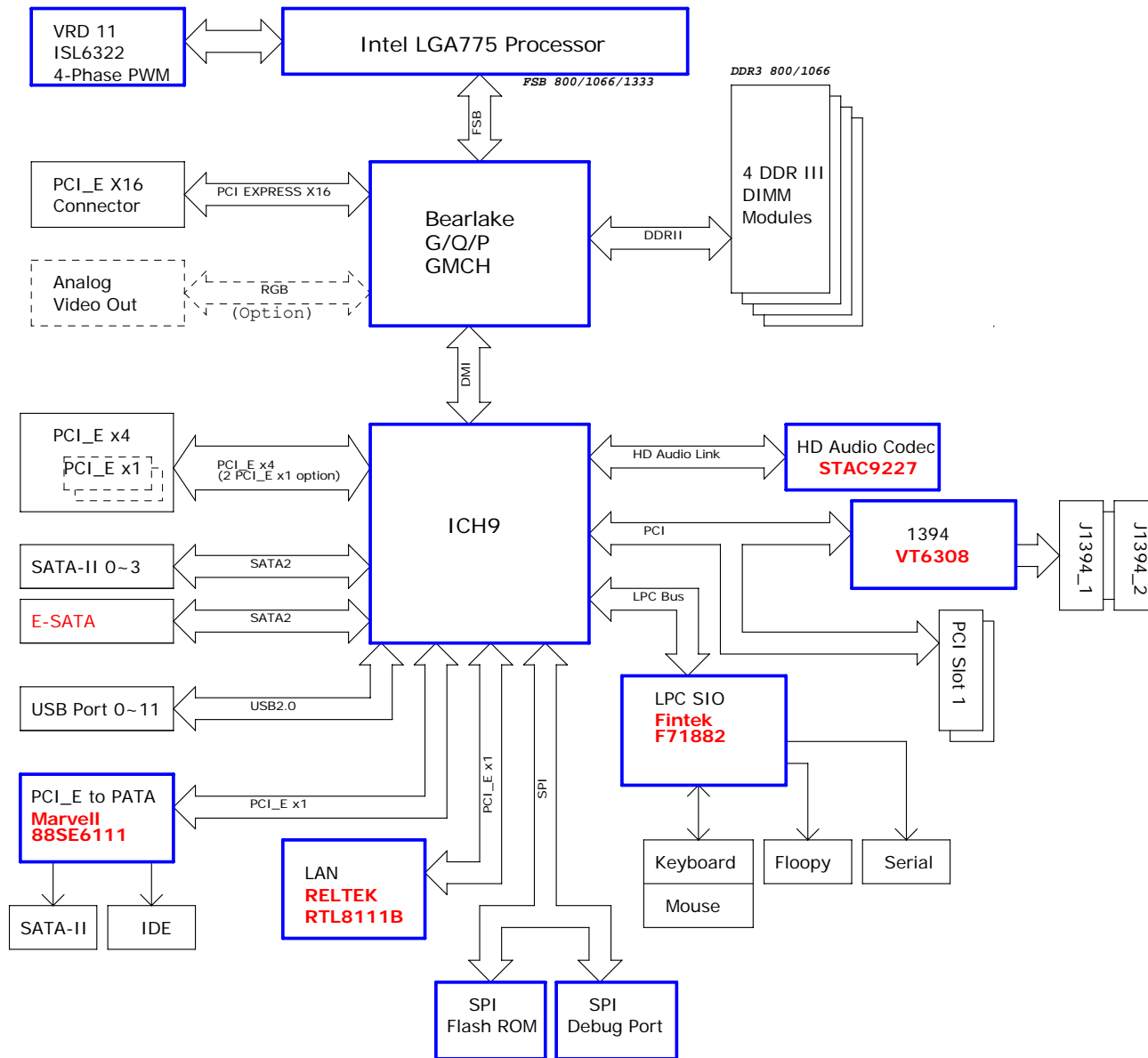
PWM: Intersil ISL6322 (4 Phases) w/ ISL6612 driver

Configuration and BOM match up

Option	Function	Orcad Configure	BOM
STD	Bearlake-G/ICH9/ICH-Fan/Non-PCIEx4	cfg-STD	601-7359-A10

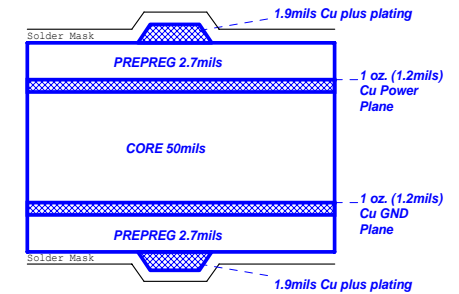
MICRO-STAR INT'L CO.,LTD			
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Block Diagram



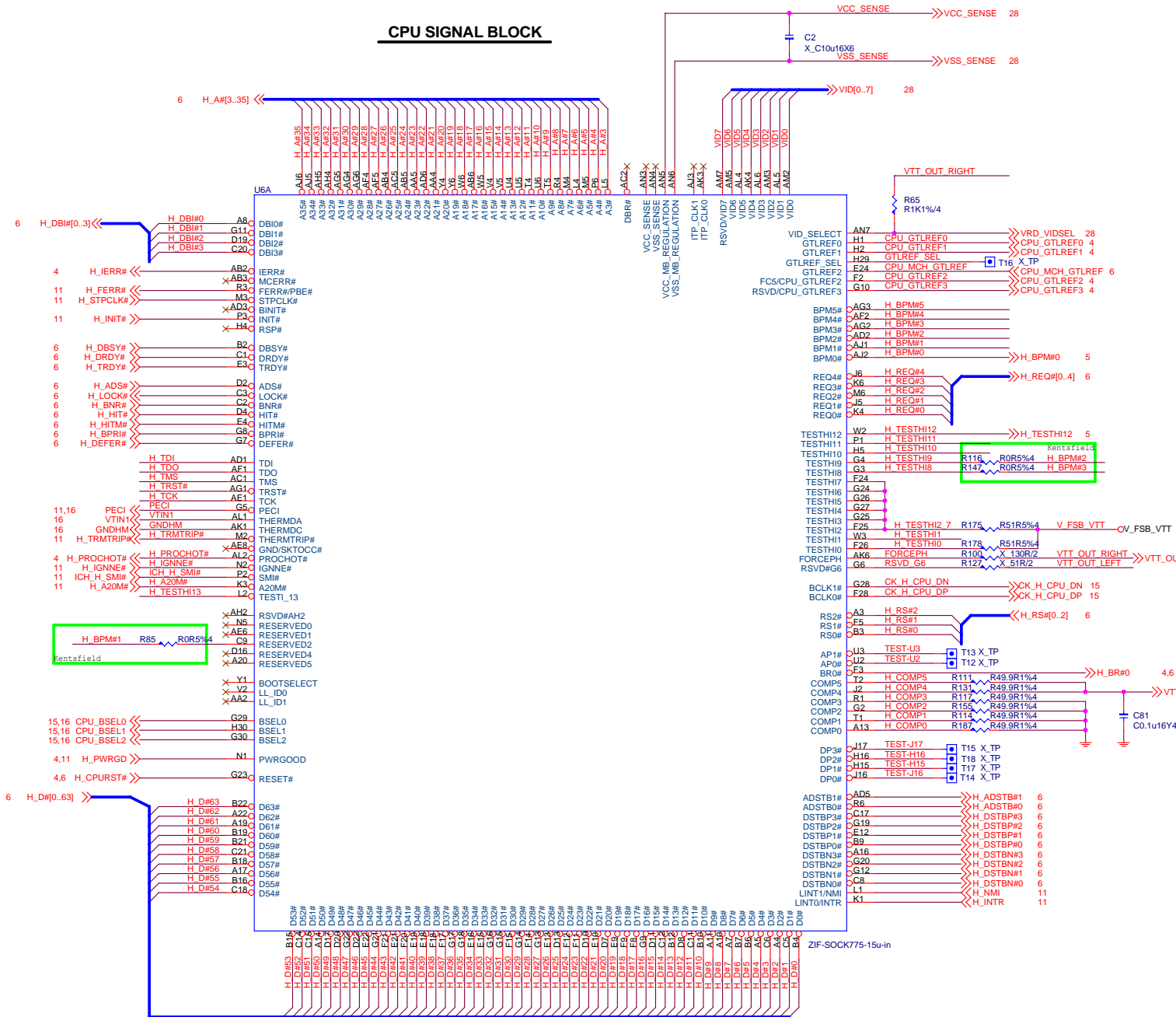
Board Stack-up

(1080 Prepreg Considerations)

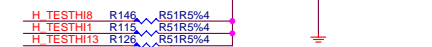
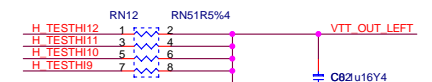
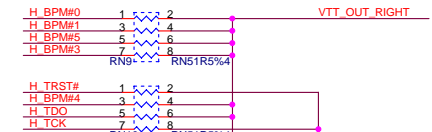
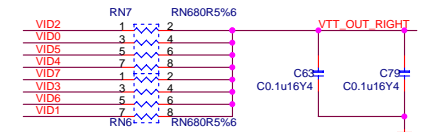


Single End 50ohm Top/Bottom : 4mils
 USB2.0 - 90ohm : 15/4.5/7.5/4.5/15
 SATA - 95ohm : 15/4/8/4/15
 LAN - 100ohm : 15/4/8/4/15
 PCIE - 95ohm : 15/4/8/4/15
 IEEE1394 - 110ohm : 15/4/9/4/15
 IDE : 15/4/8/4/15

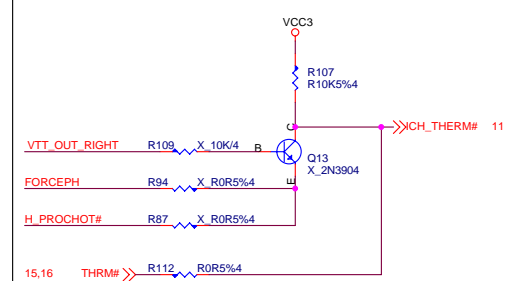
CPU SIGNAL BLOCK



PULL HIGHT PULL DOWN



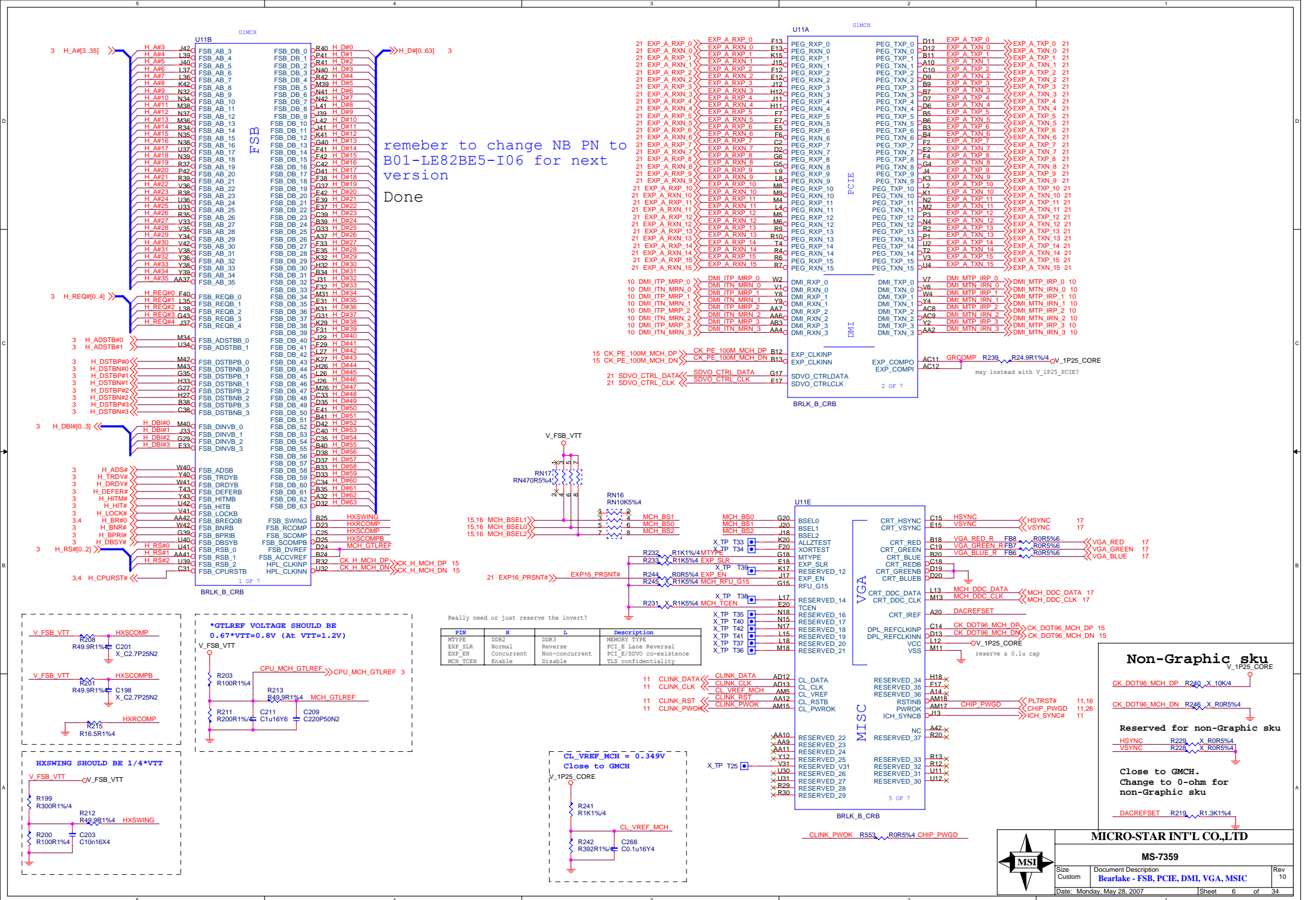
Thermal TRIP



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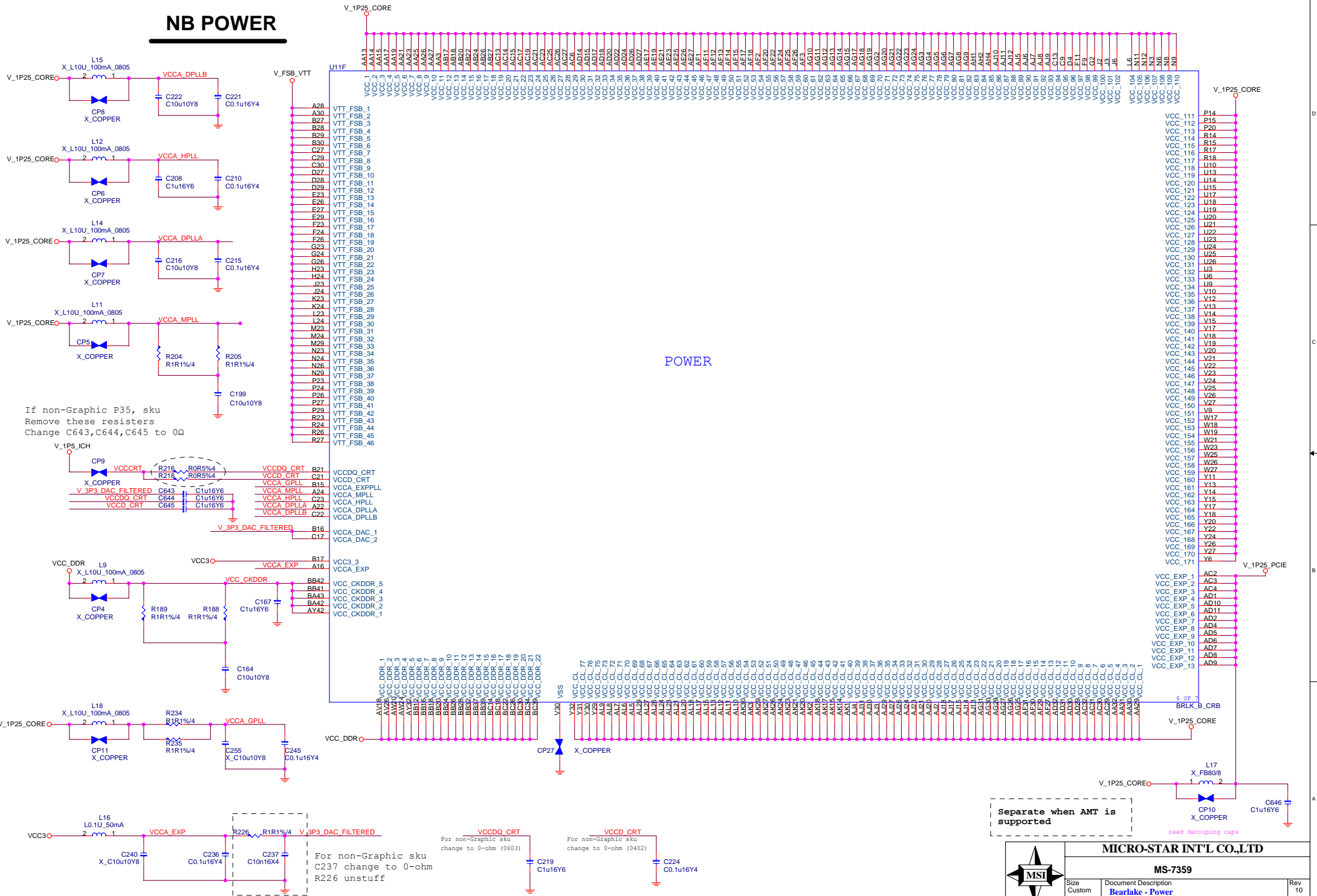
MS-7359

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Custom	Bearlake - FSB, PCIE, DMI, VGA, MSIC
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NB POWER

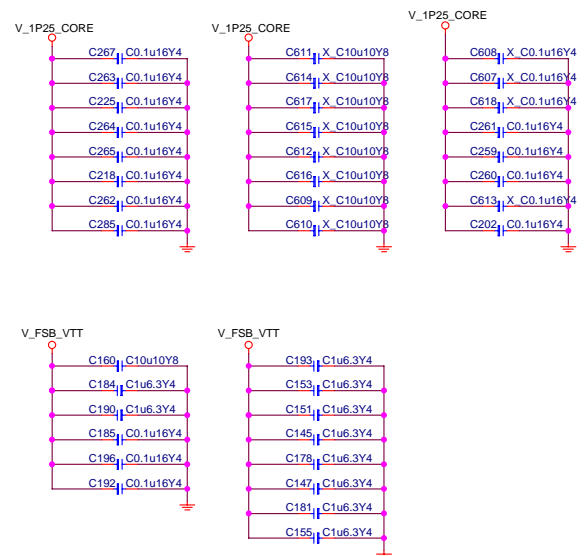
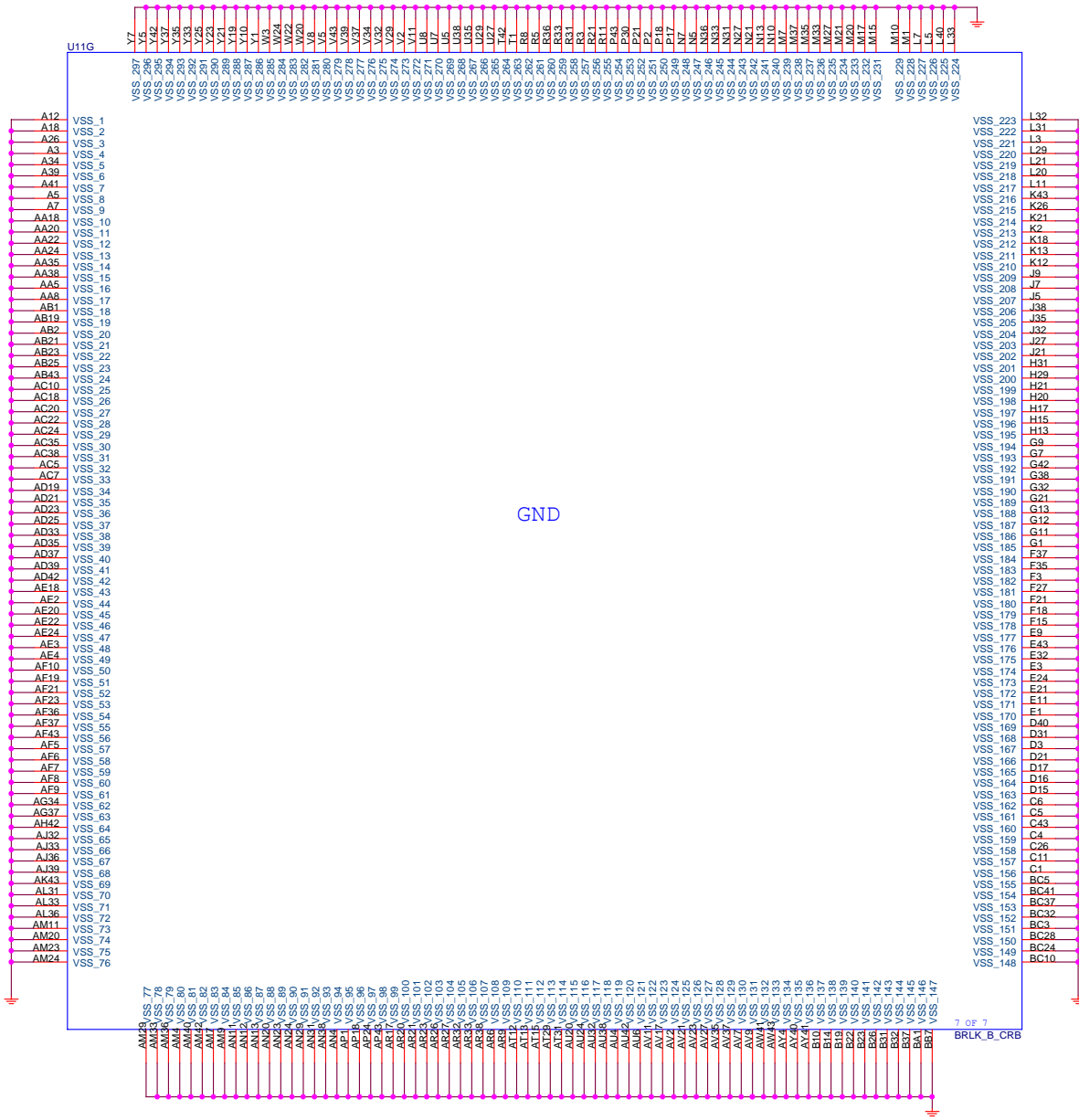
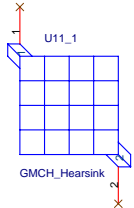


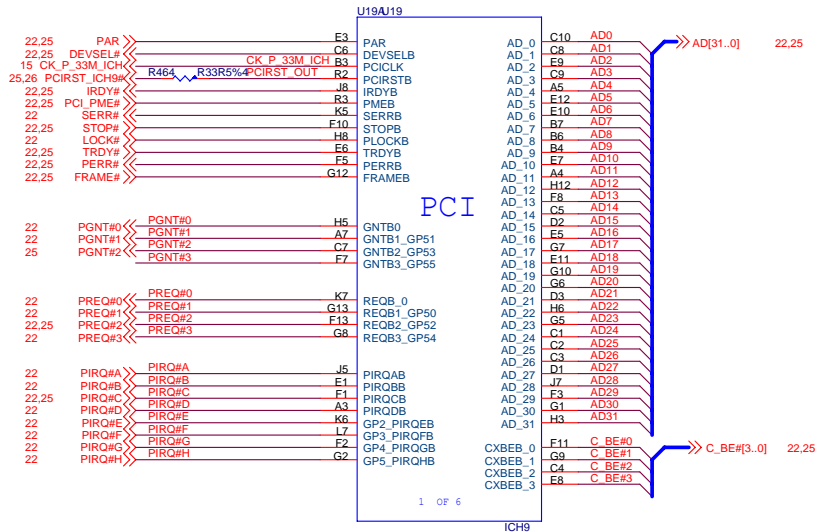
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remeber to change SB PN to B01-801IB05-I06 for next version

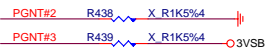
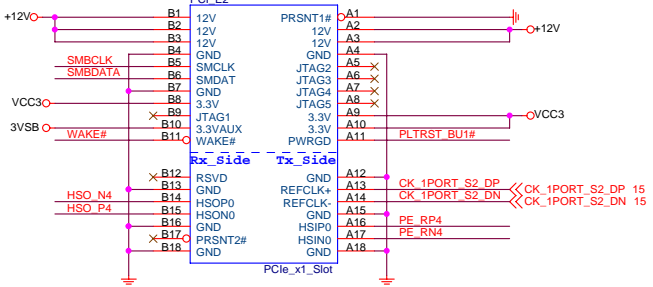
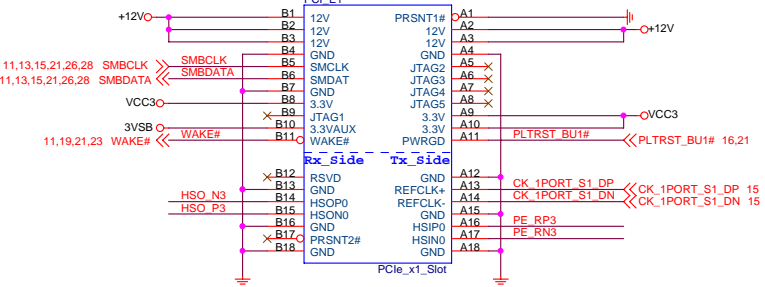
Done

R459 R1K5%4 PGNT#0
R363 X R1K5%4 SPI_CS1# 11

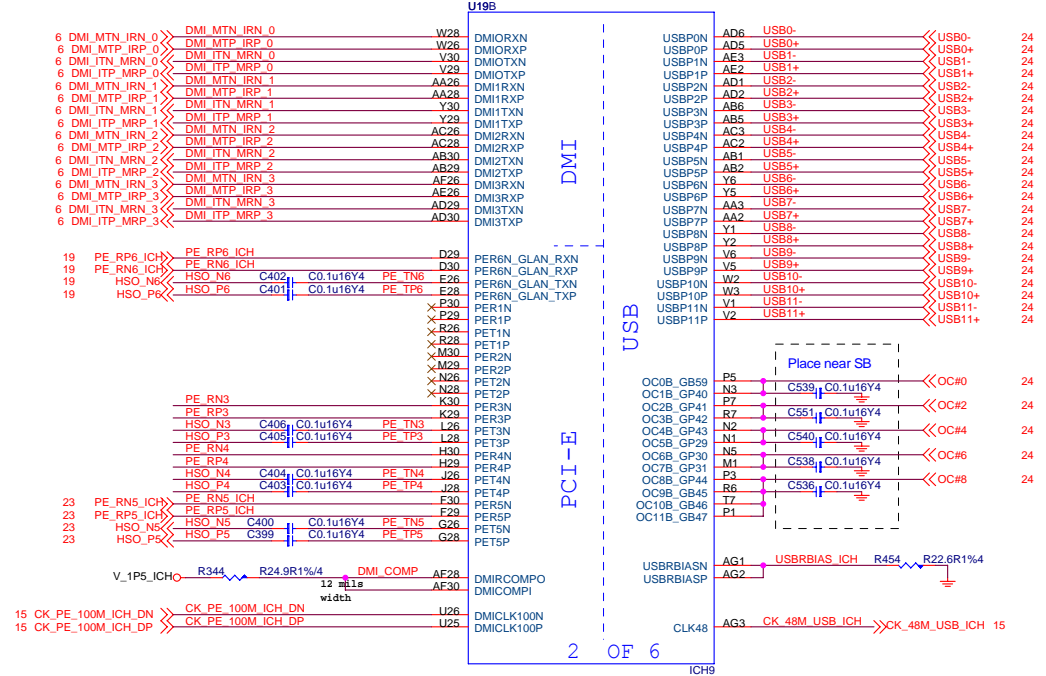
BOOT SELECT STRAPS			
BOOT DEVICE	GNT#0	SPI_CS1#	
FWH	1	1	
SPI	0	X	
PCI	1	0	

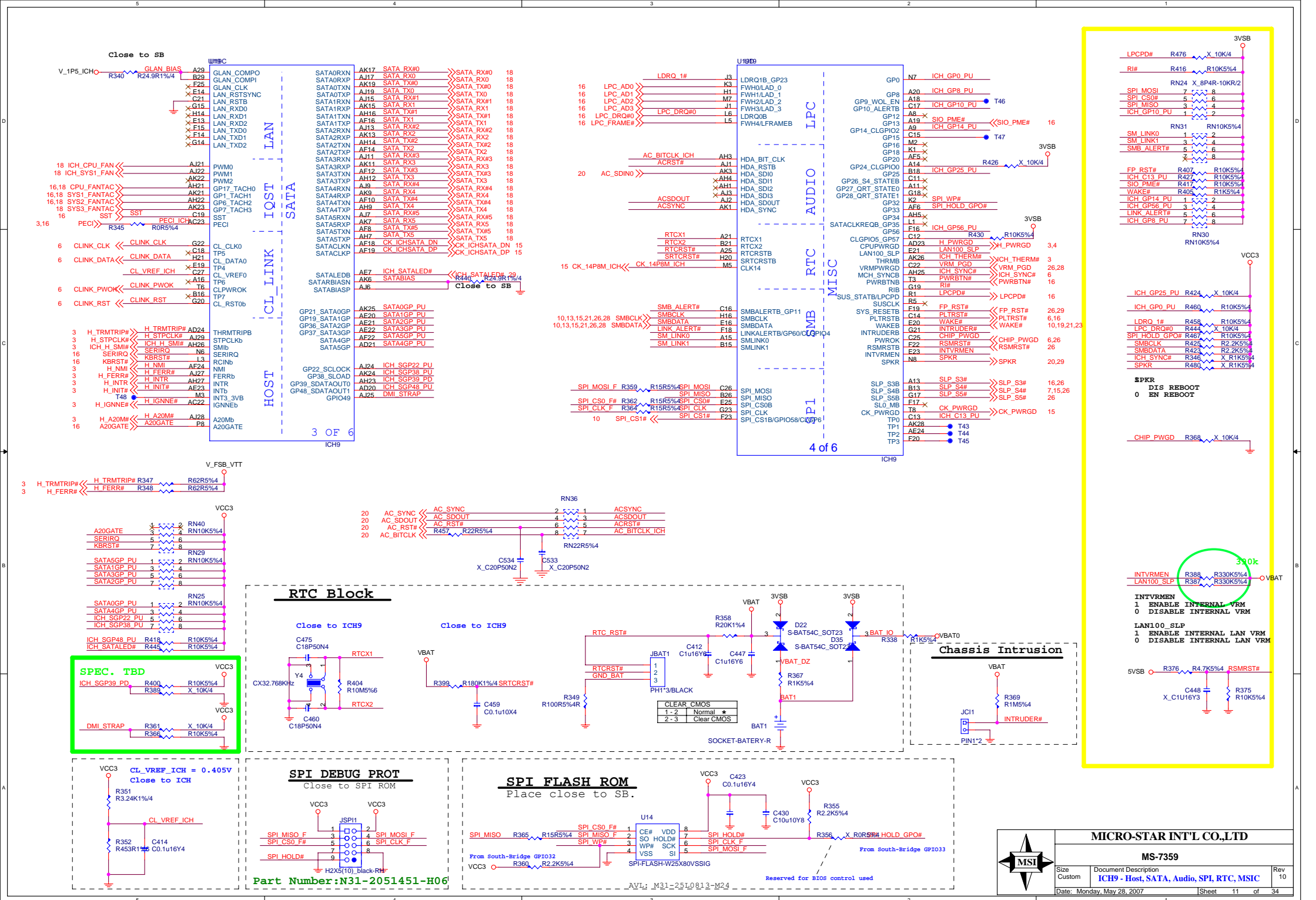
PGNT#2 R438 X R1K5%4
PGNT#3 R438 X R1K5%4 3VSB

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

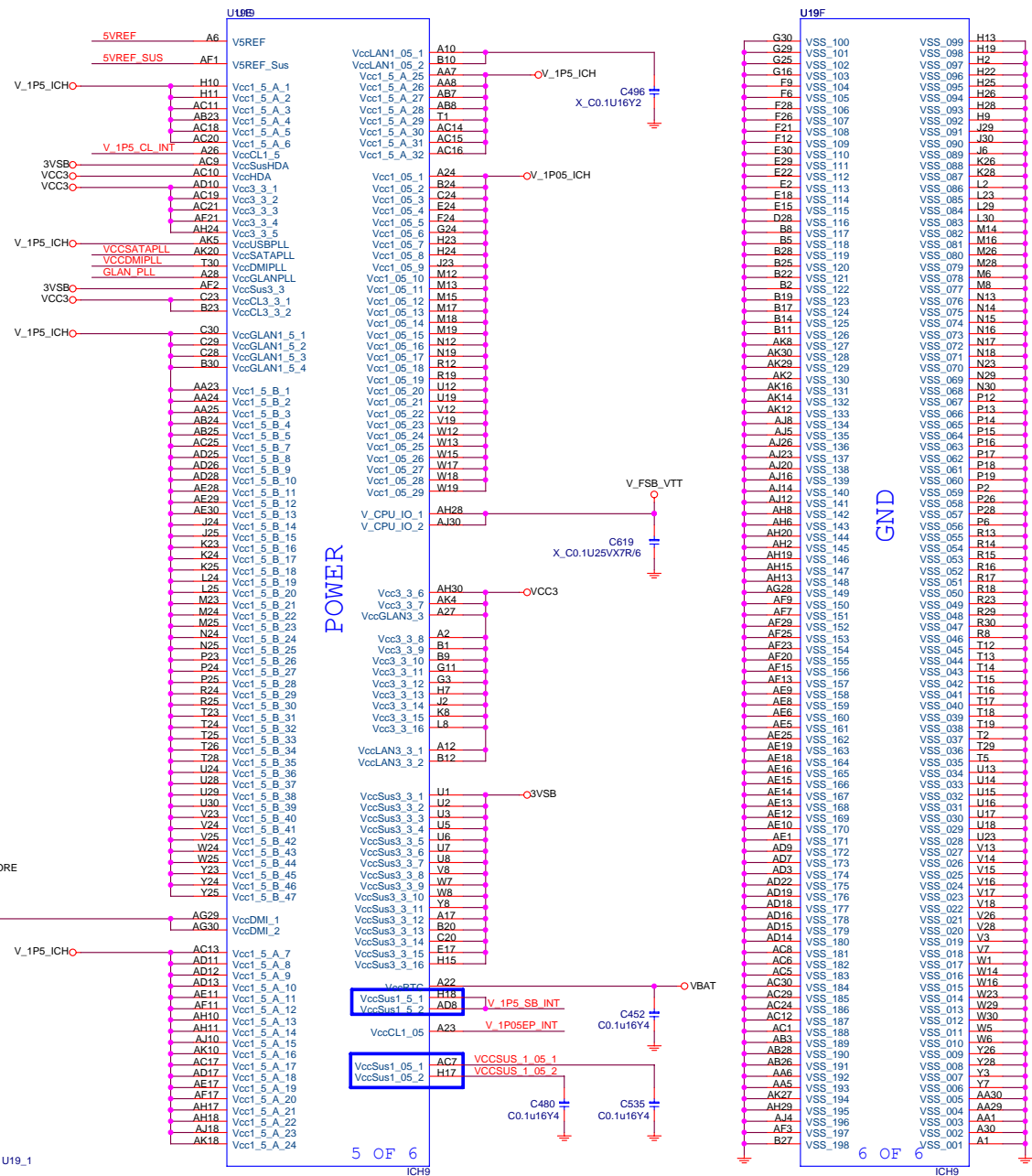
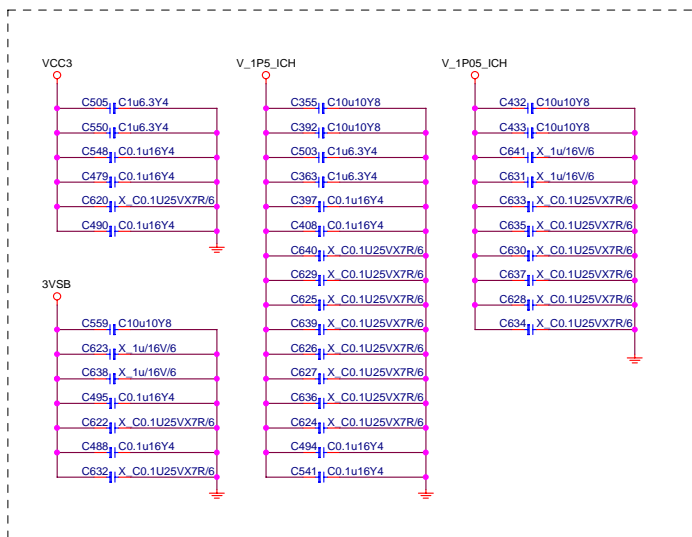
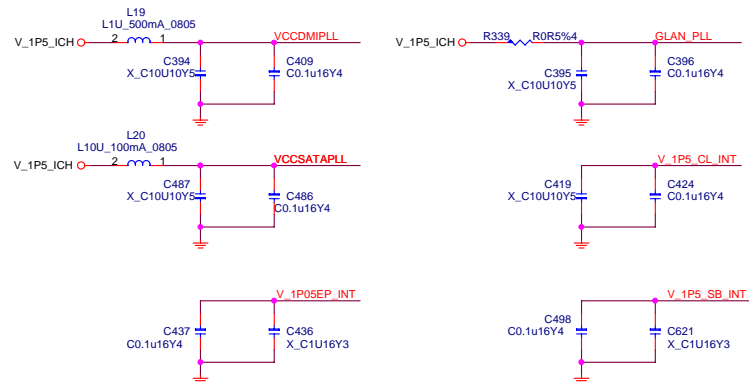


SIGNAL	H	L	DES.
GNT3	DIS	EN	A16 OVERIDE
GNT2	N/A	SET BIT	PCIE PORT CONFIG 2 BIT 0 (5-6)





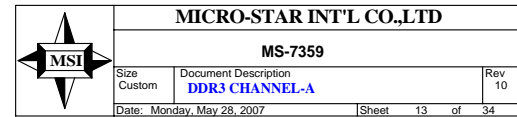
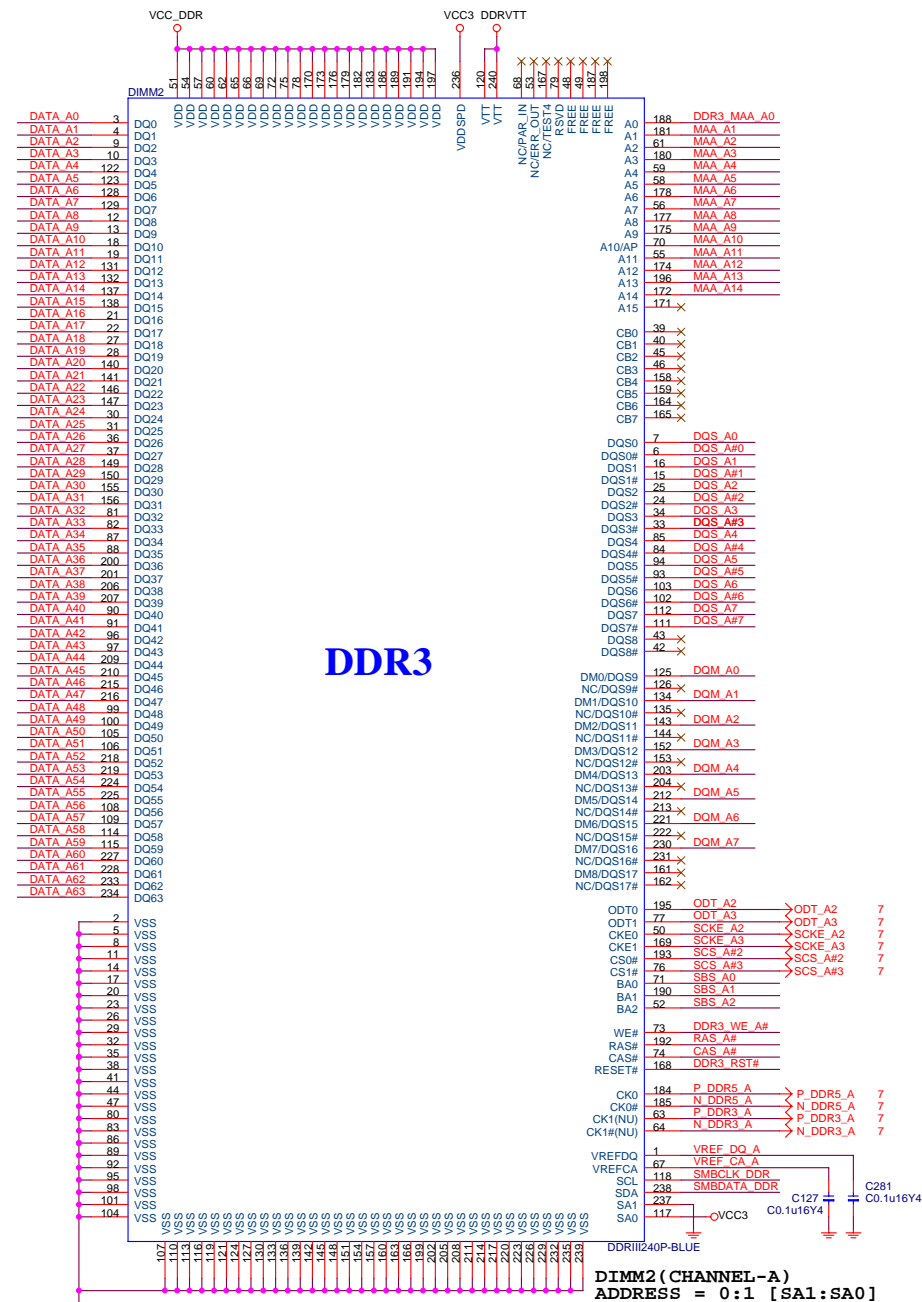
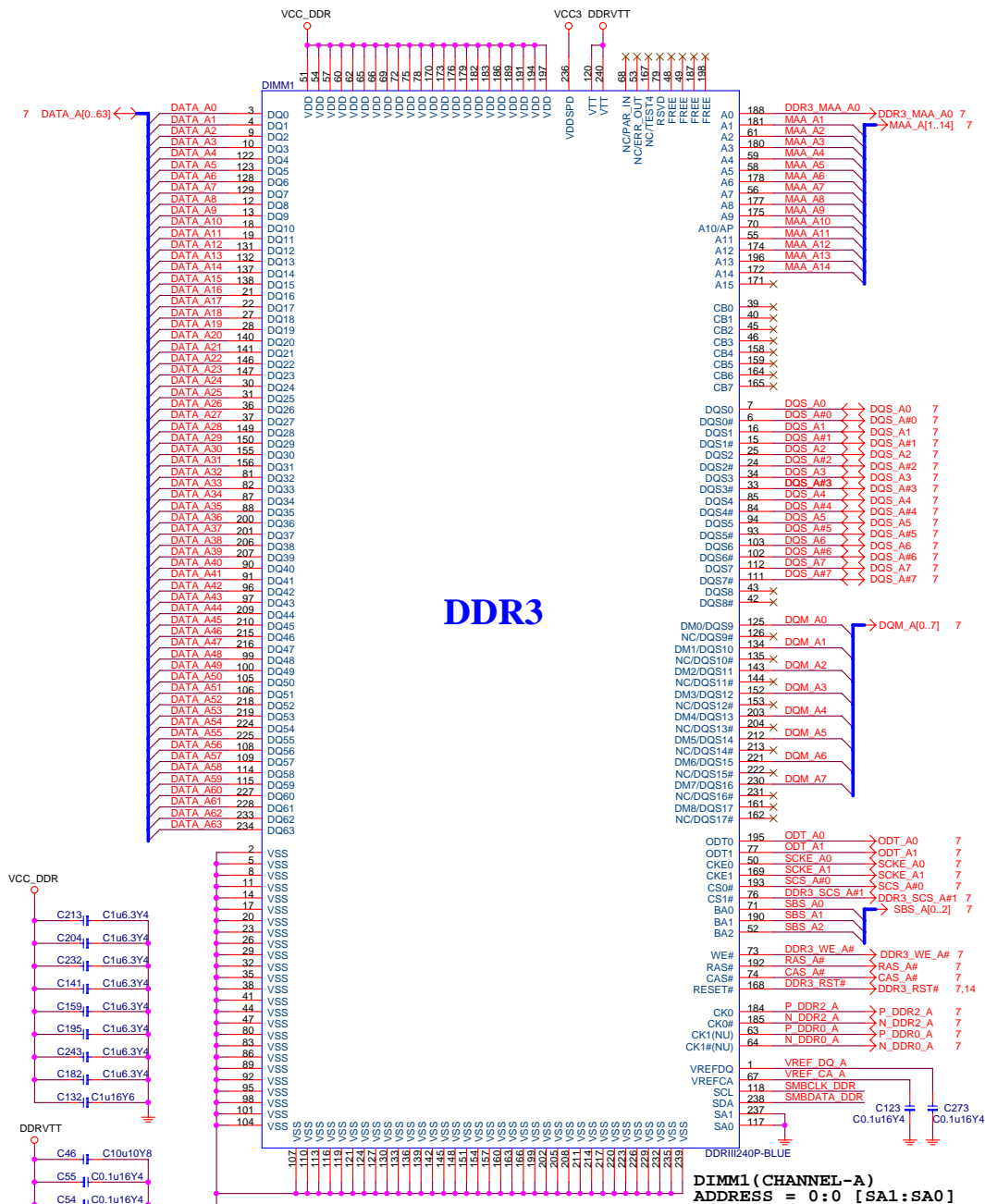
5VREF & 5VREF_SUS Sequencing Circuit



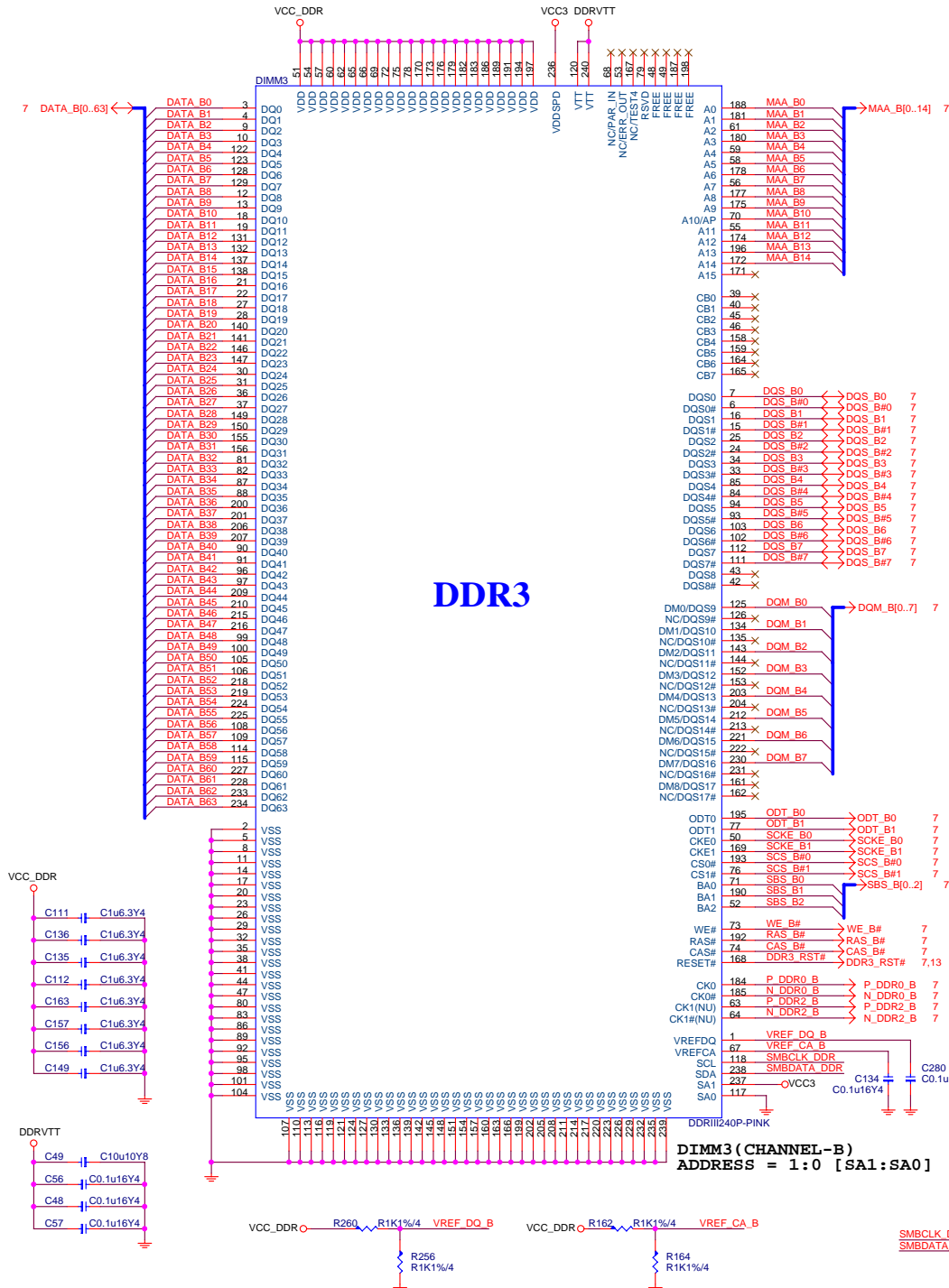
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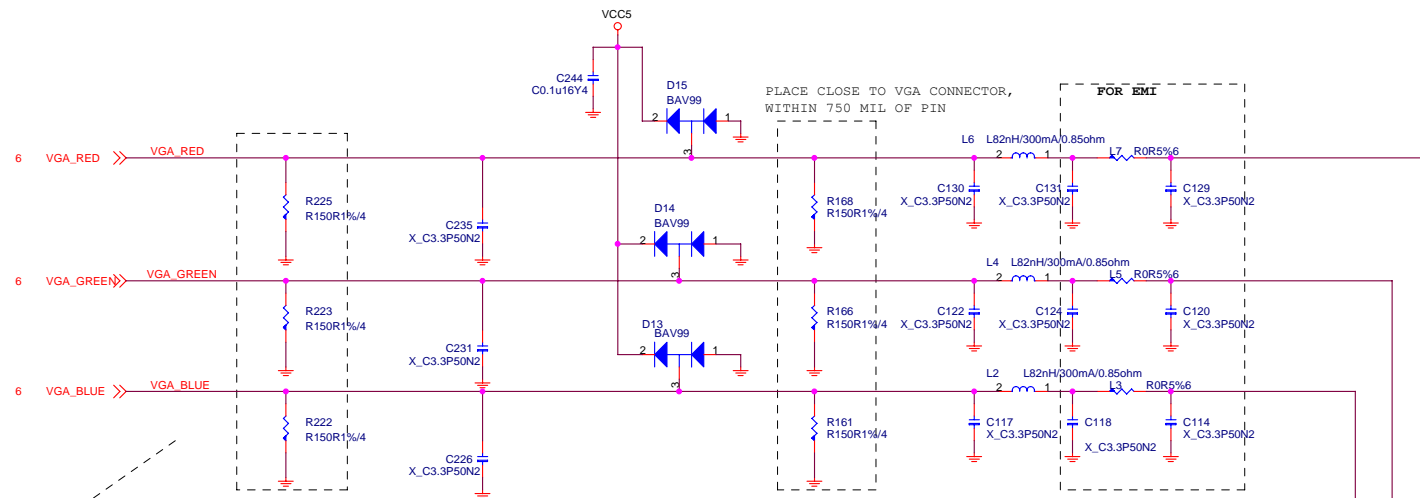
DDR3 CHANNEL-A



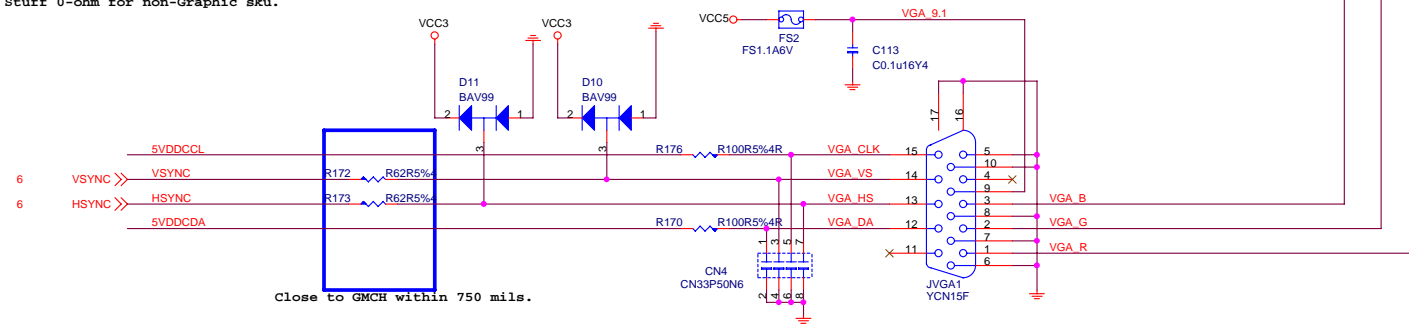
DDR3 CHANNEL-B



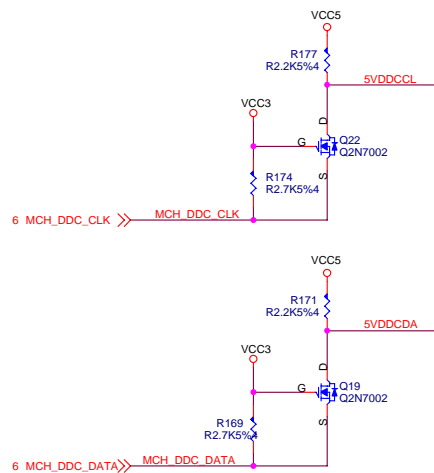
Video Connector



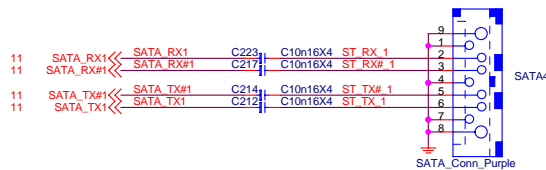
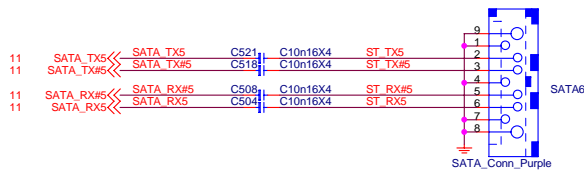
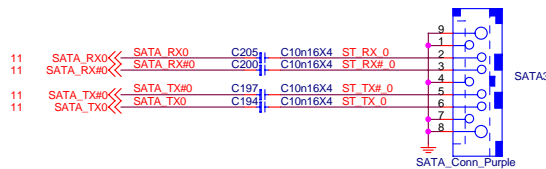
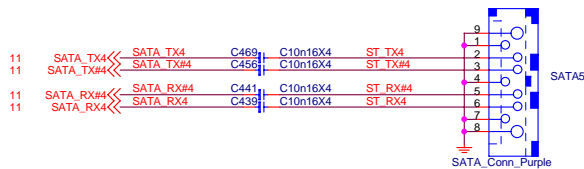
Close to GMCH within 250 mils.
Stuff 0-ohm for non-Graphic sku.



Close to GMCH within 750 mils.



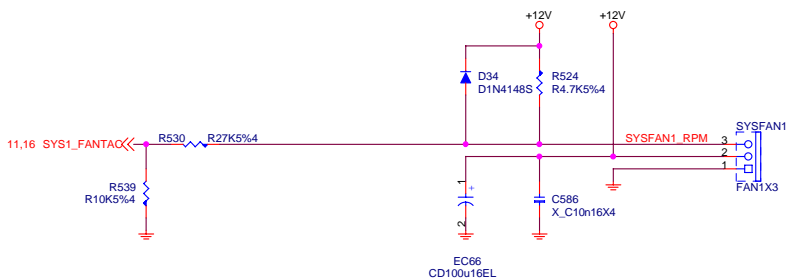
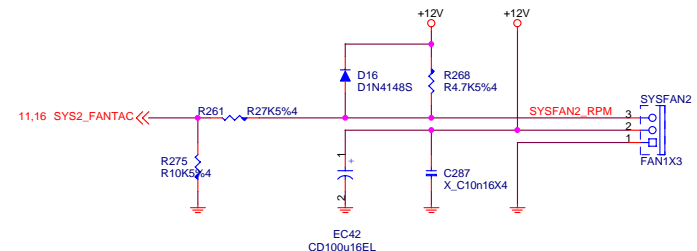
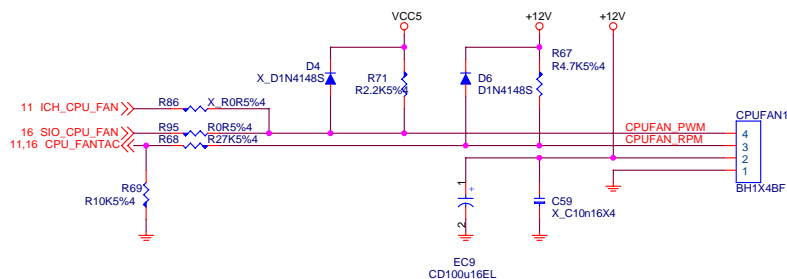
MICRO-STAR INT'L CO.,LTD			
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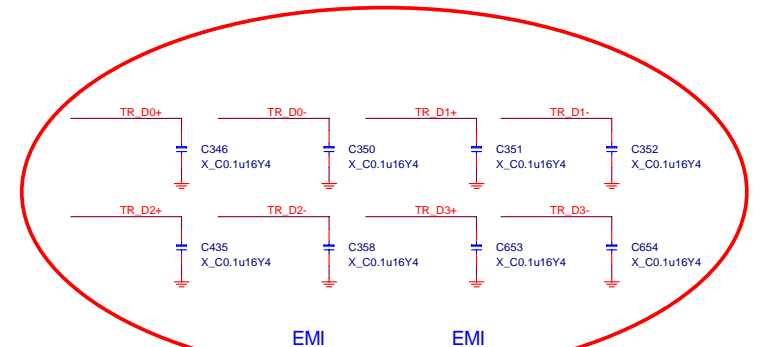
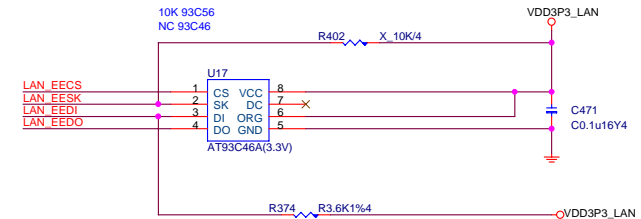
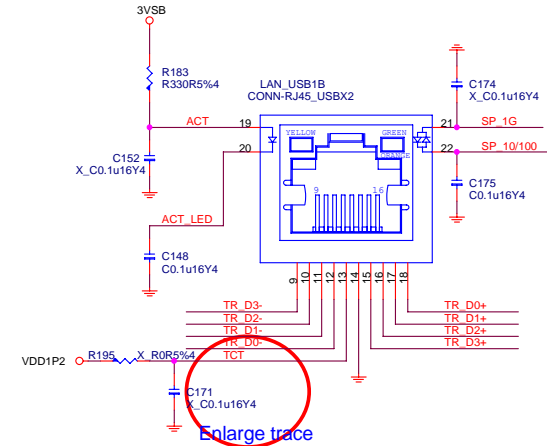
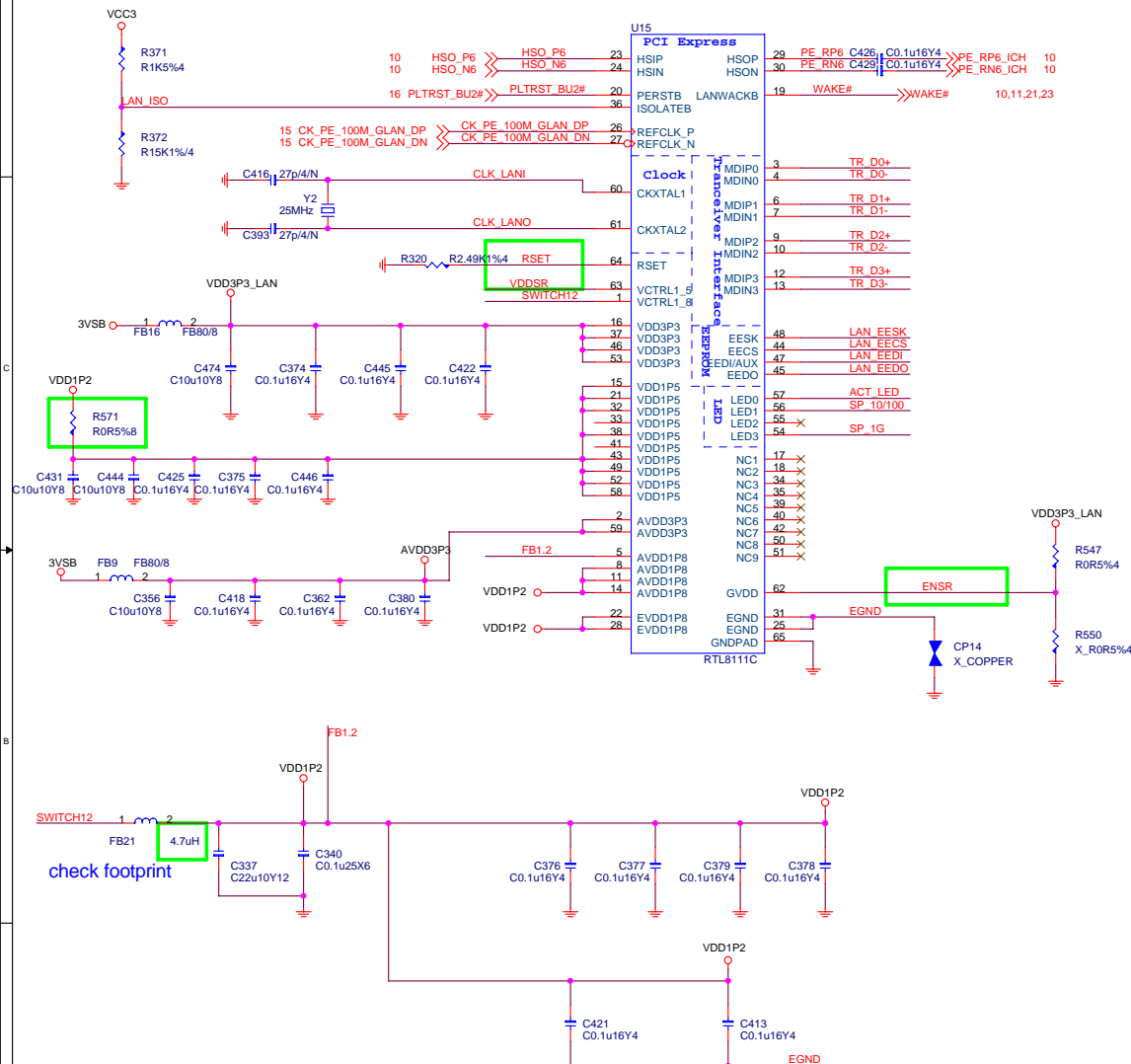
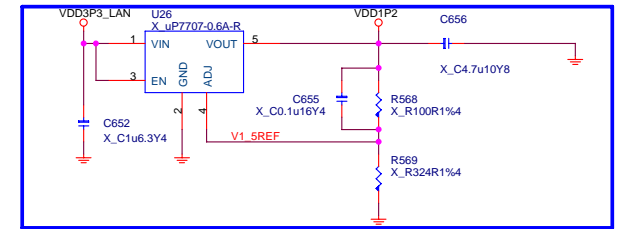
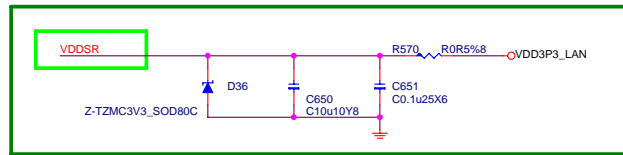


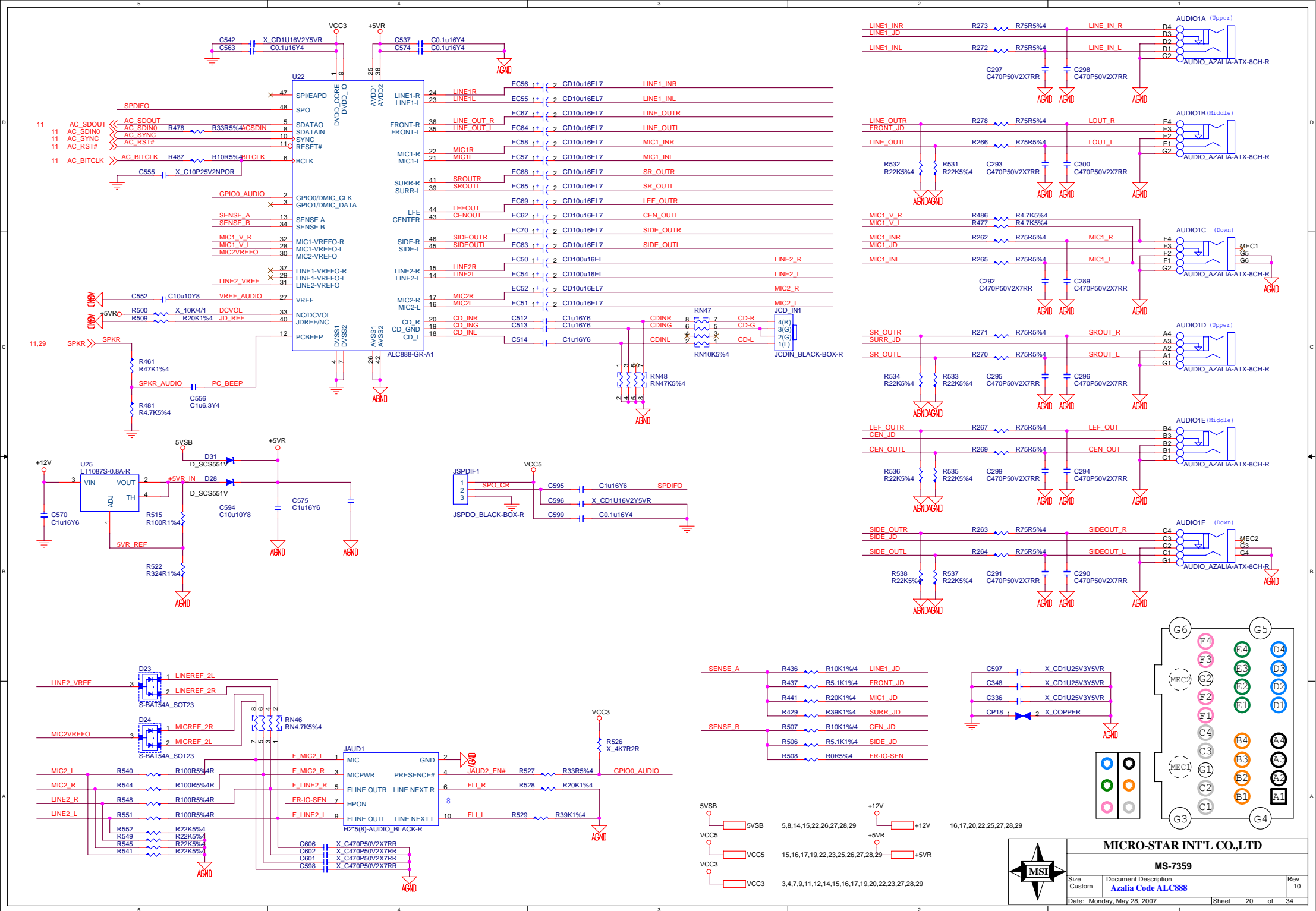
e-SATA trace length should be less than 10 inch.(Connector to Chip)



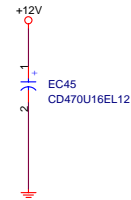
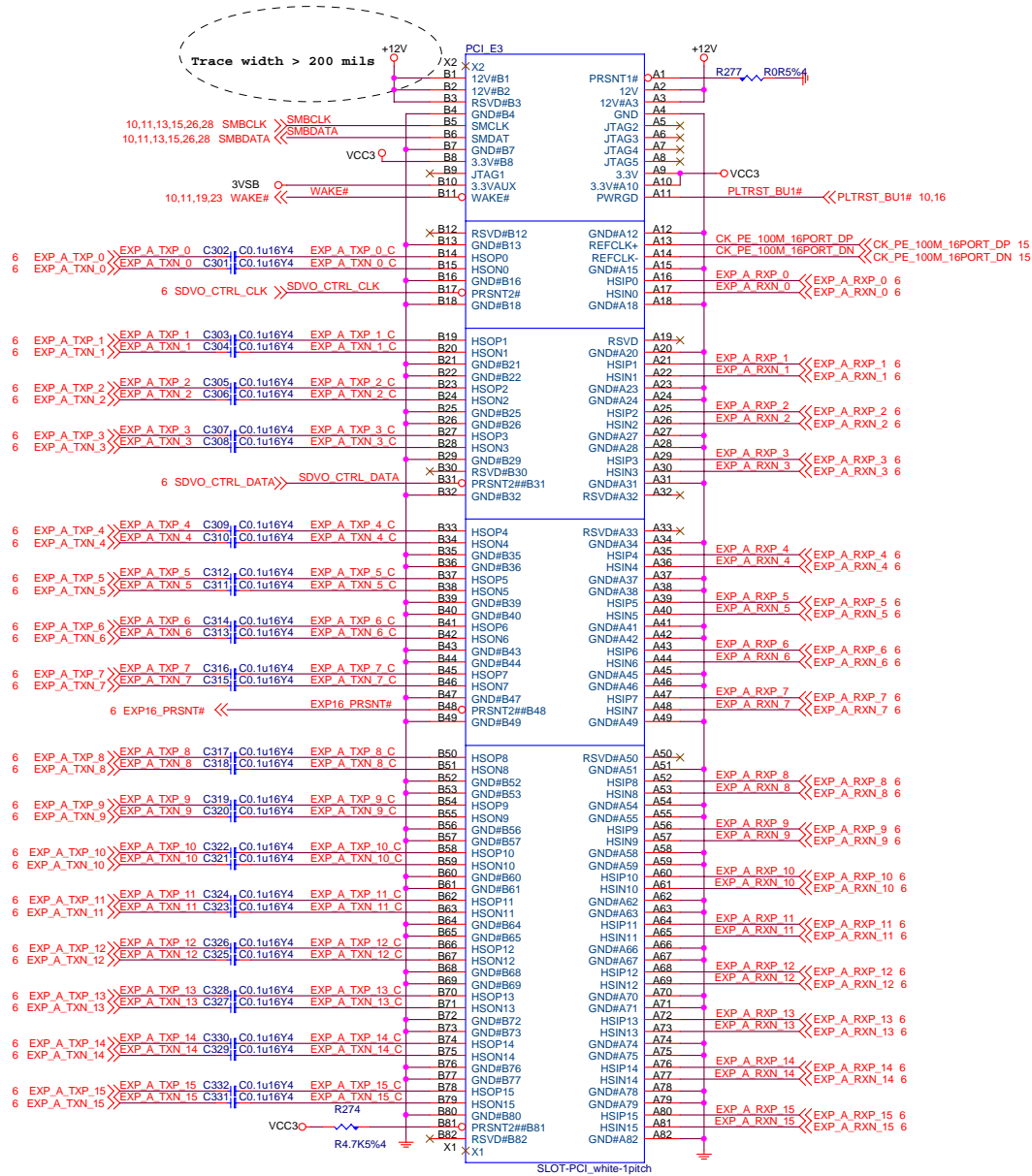
FAN-COUNTROL CIRCUIT







PCI_Express X16 Slot

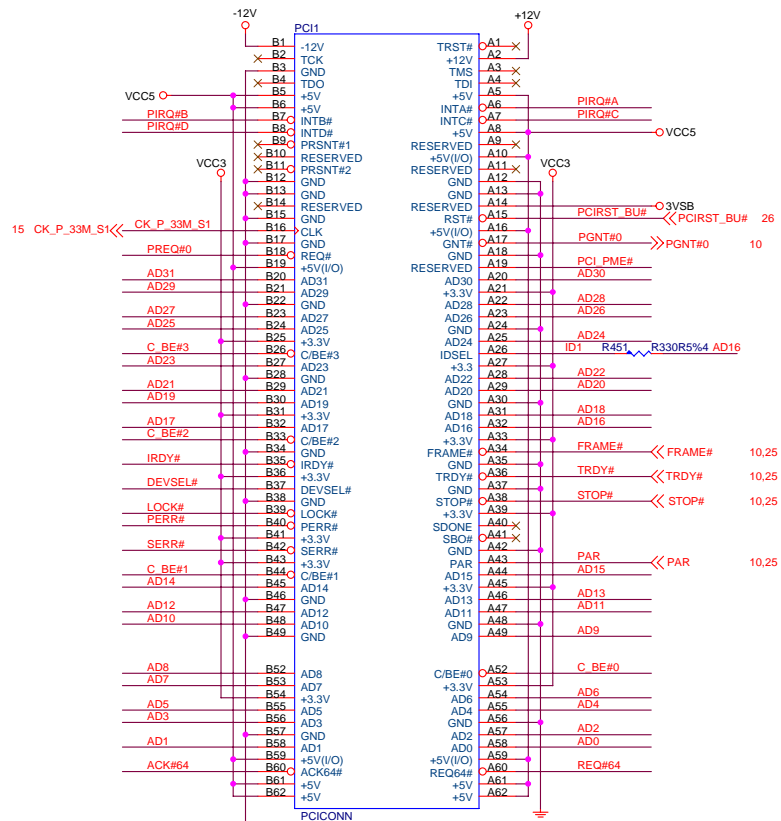


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Custom	PCIE x16 & x4 Slot	10
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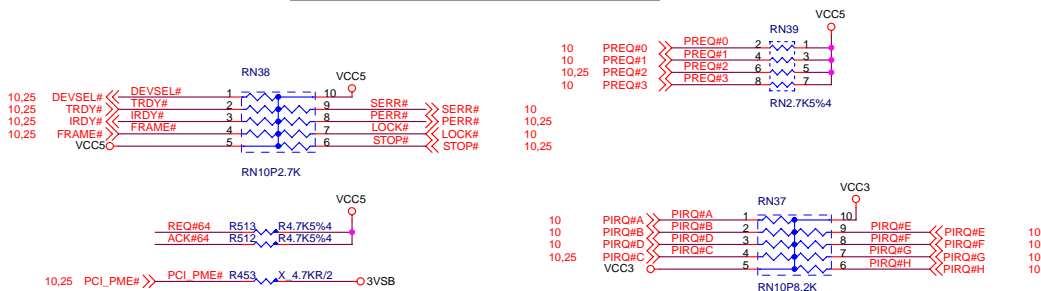
PCI SLOT 1 (PCI VER: 2.2 COMPLY)



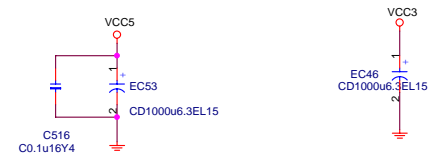
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

10,25 AD[31..0] << AD[31..0]
10,25 C_BE#[3..0] << C_BE#[3..0]

PCI PULL-UP / DOWN RESISTORS

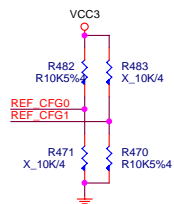
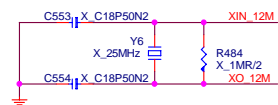
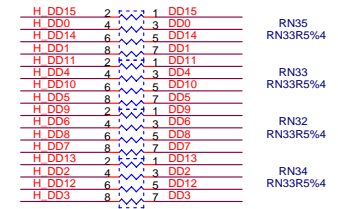
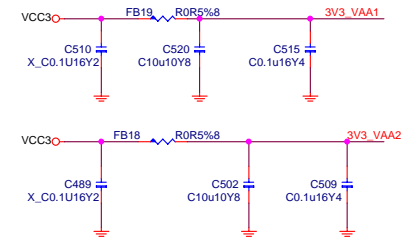
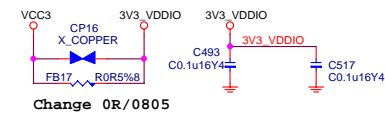
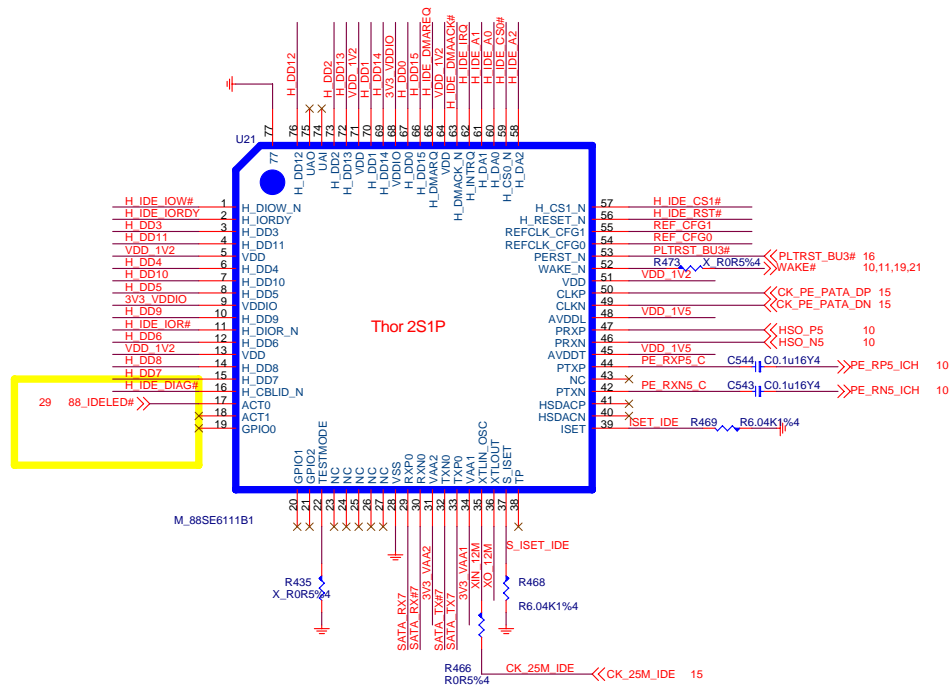


PCI SLOT DECOUPLING CAPACITORS

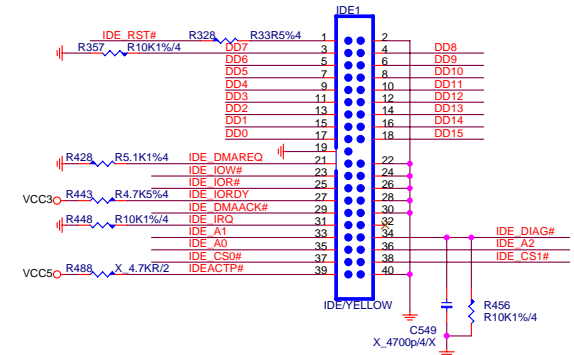
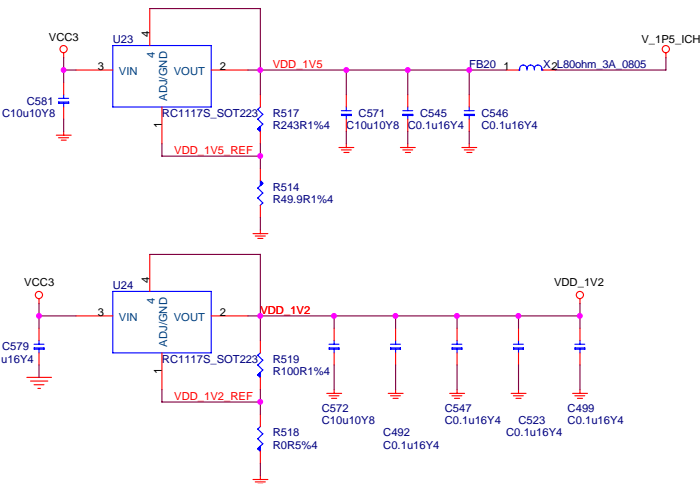


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MSI		
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Custom	PCI Slot 1 & 2	10
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Hi-Speed PCIE to SATA/PATA Bridge



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



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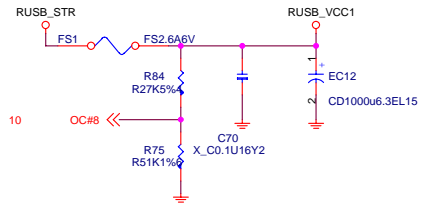
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Size	Document Description
Custom	Marvell 88SE6111 PCIE to PATA/SATA

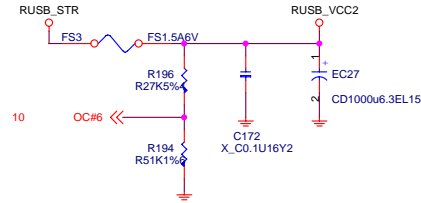
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Rear USB Connector

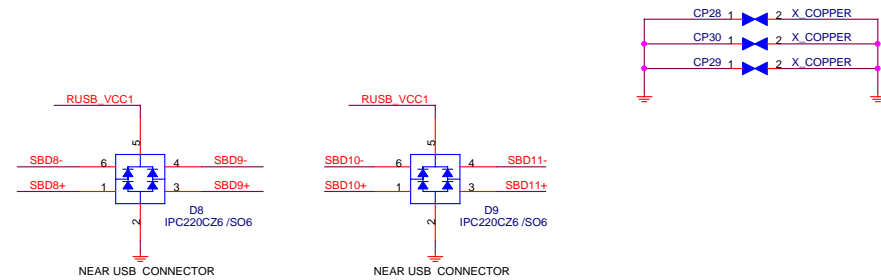
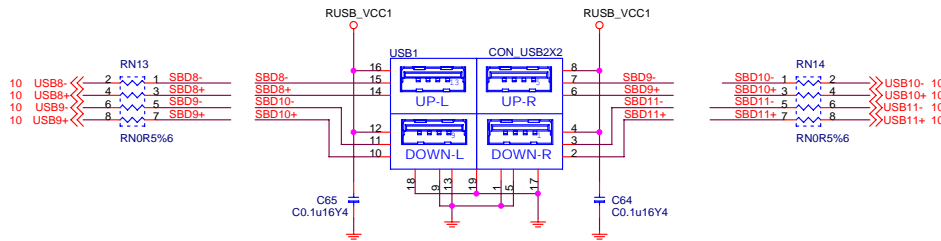
USB POWER FOR PORT 8,9,10,11



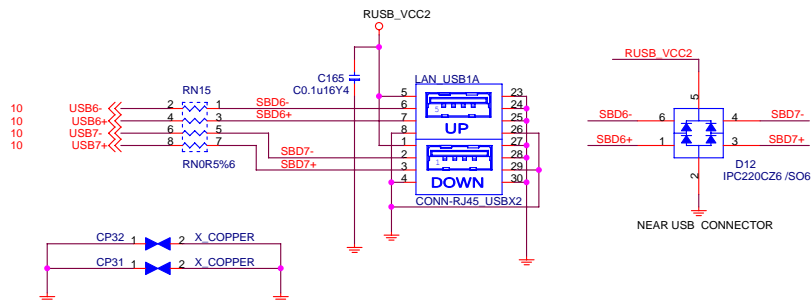
USB POWER FOR PORT 6,7



REAR USB PORT 8-11 (2x2)

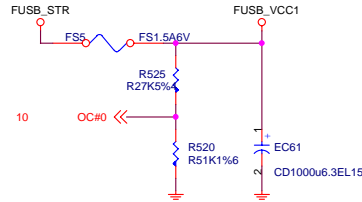


REAR USB PORT 6,7 (With LAN)

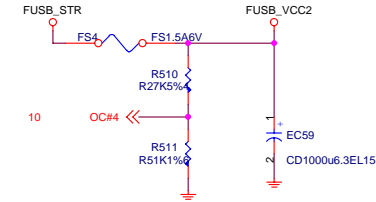


Front USB Connector

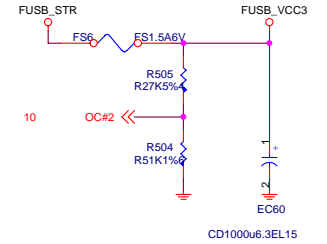
USB POWER FOR PORT 0,1



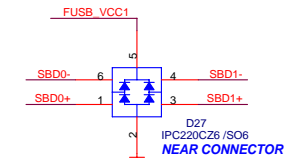
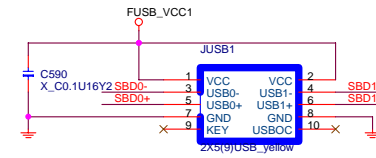
USB POWER FOR PORT 4,5



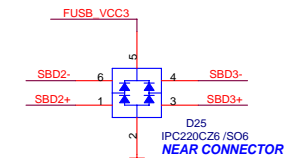
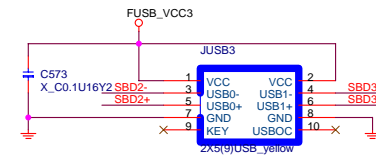
USB POWER FOR PORT 2,3



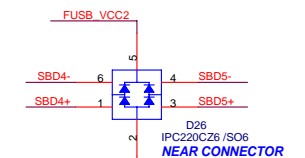
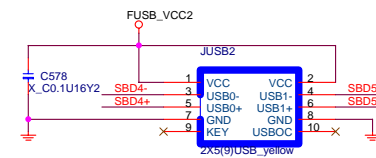
FRONT USB PORT 0,1



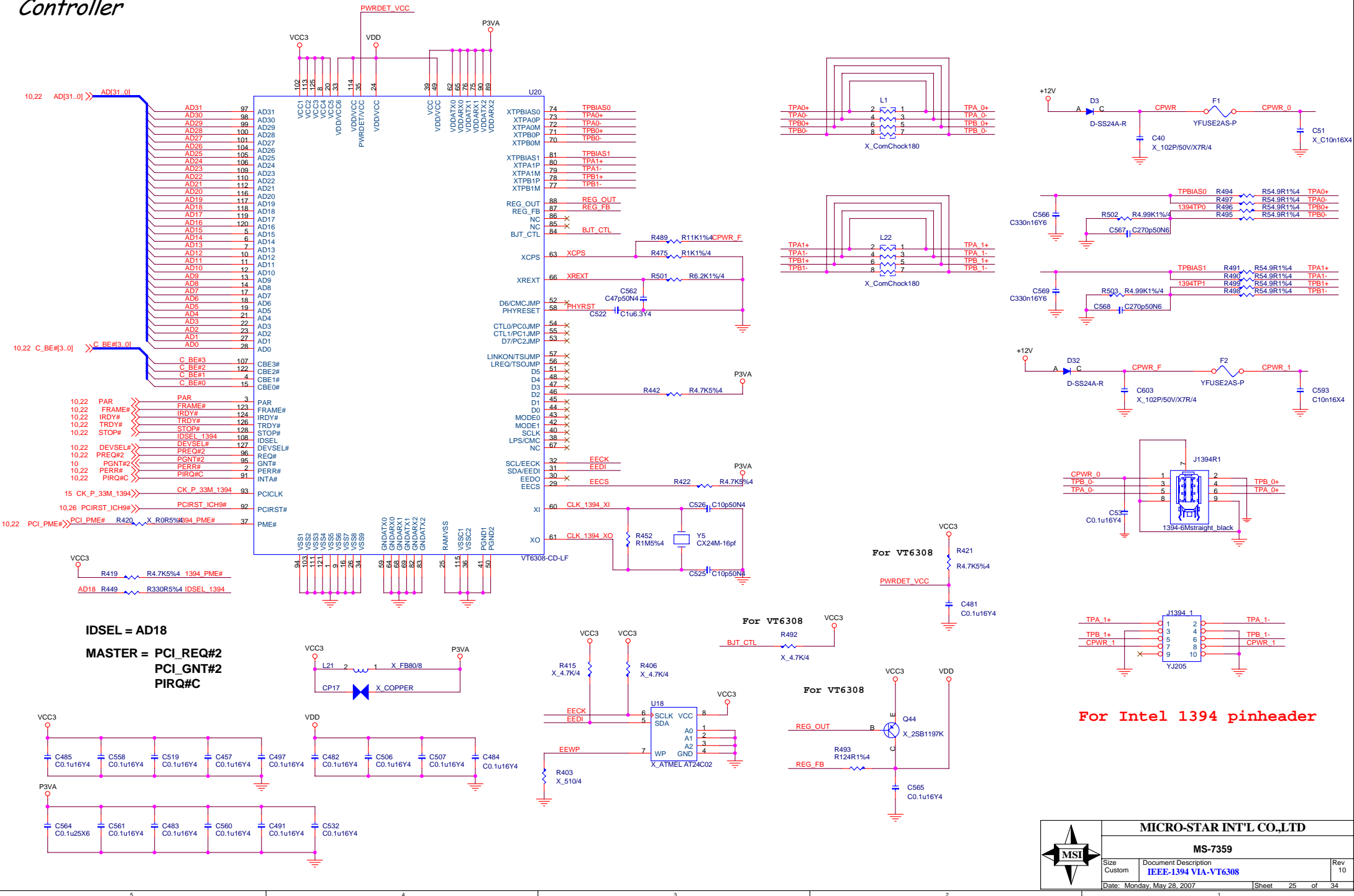
FRONT USB PORT 2,3



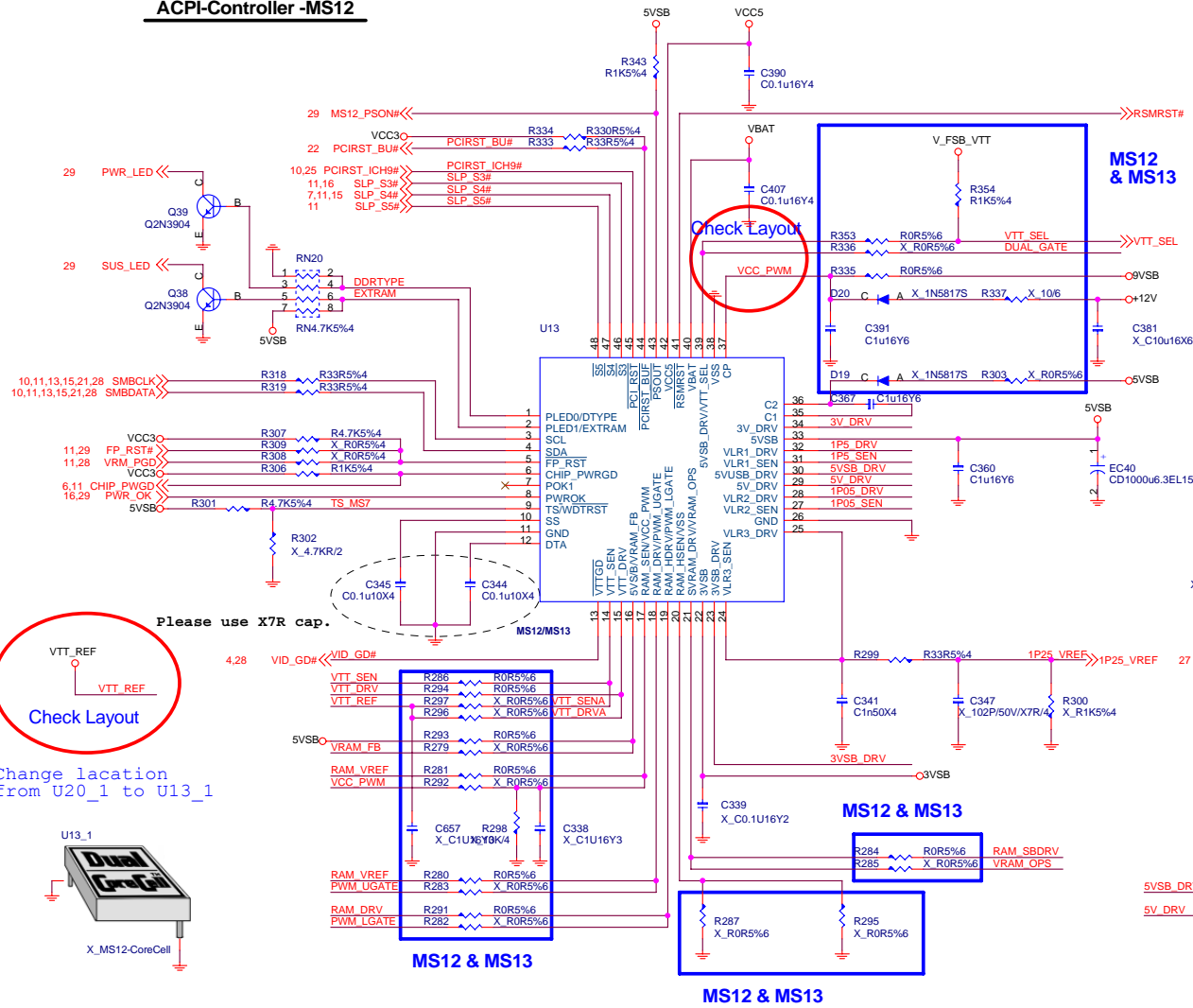
FRONT USB PORT 4,5



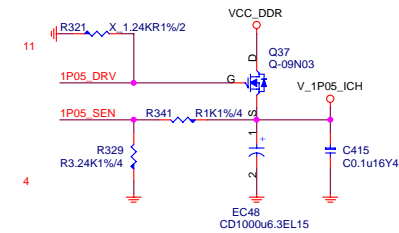
1394a OHCI Link Layer Controller



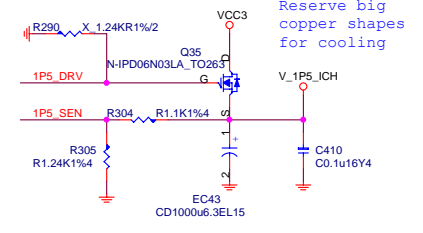
ADD P/N for MS12 while the P/N is available



V_1P05_ICH...1.43A

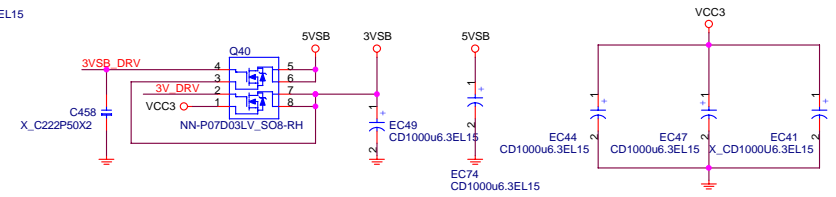


V_1P5_ICH...2.75A

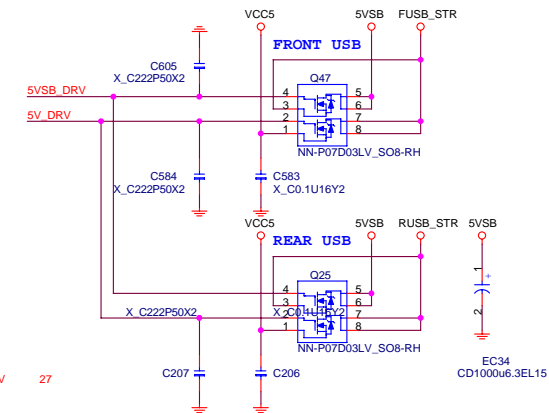


Reserve big
copper shapes
for cooling

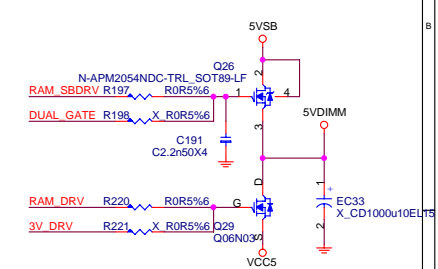
3VSB Power



5V-USB Power 3A/Per-side



5VDIMM



	MS12		MS13	
PIN	Attach	Delete	Attach	Delete
14	R286	R297	R297	R286
15	R294	R296	R296	R294
16	R293	R279	R279	R293
17	R281	C338, R292,R298	C338, R292,R298	R281
18	R280	R283	R283	R280
19	R291	R282	R282	R291
20	N/A	R287	R287	N/A
21	R284	R285	R285	R284
36	N/A	D19,R303	D19,R303	N/A
37	R335	D20,R337	D20,R337	R335

PIN	PIN INTRODUCTION	
1	PLED0/DDRTYPE	DDRTYPE 0: DDR3(1.5V) 1: DDR2(1.8V)
2	PLED1/EXTRAM	EXTRAM 0: LINEAR MODE 1: PWM MODE
9	TS_MS7	TS_MS7: 0: MS12 Timing 1: MS7 Timing
39	VTT_SEL	VTT_SEL (Pin-39) 0: VTT=1.1V 1: VTT=1.2V

<u>VTT_DRV</u>	→VTT_DRV	27
<u>PWM_UGATE</u>	→PWM_UGATE	27
<u>VRAM_OPS</u>	→VRAM_OPS	27
<u>PWM_LGATE</u>	→PWM_LGATE	27
<u>RAM_VREF</u>	→RAM_VREF	27
<u>VRAM_FB</u>	→VRAM_FB	27

MS12	MS13
R197,R220 X_R198,X_R221	X_R197,X_R220 R198,R221



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MS-7359

Size	Document Description
Custom	MS10-015610-GOLD-ALL-ORDER-POWER

Custom	MS12 & MS13 COLAY & DDR POWER		10
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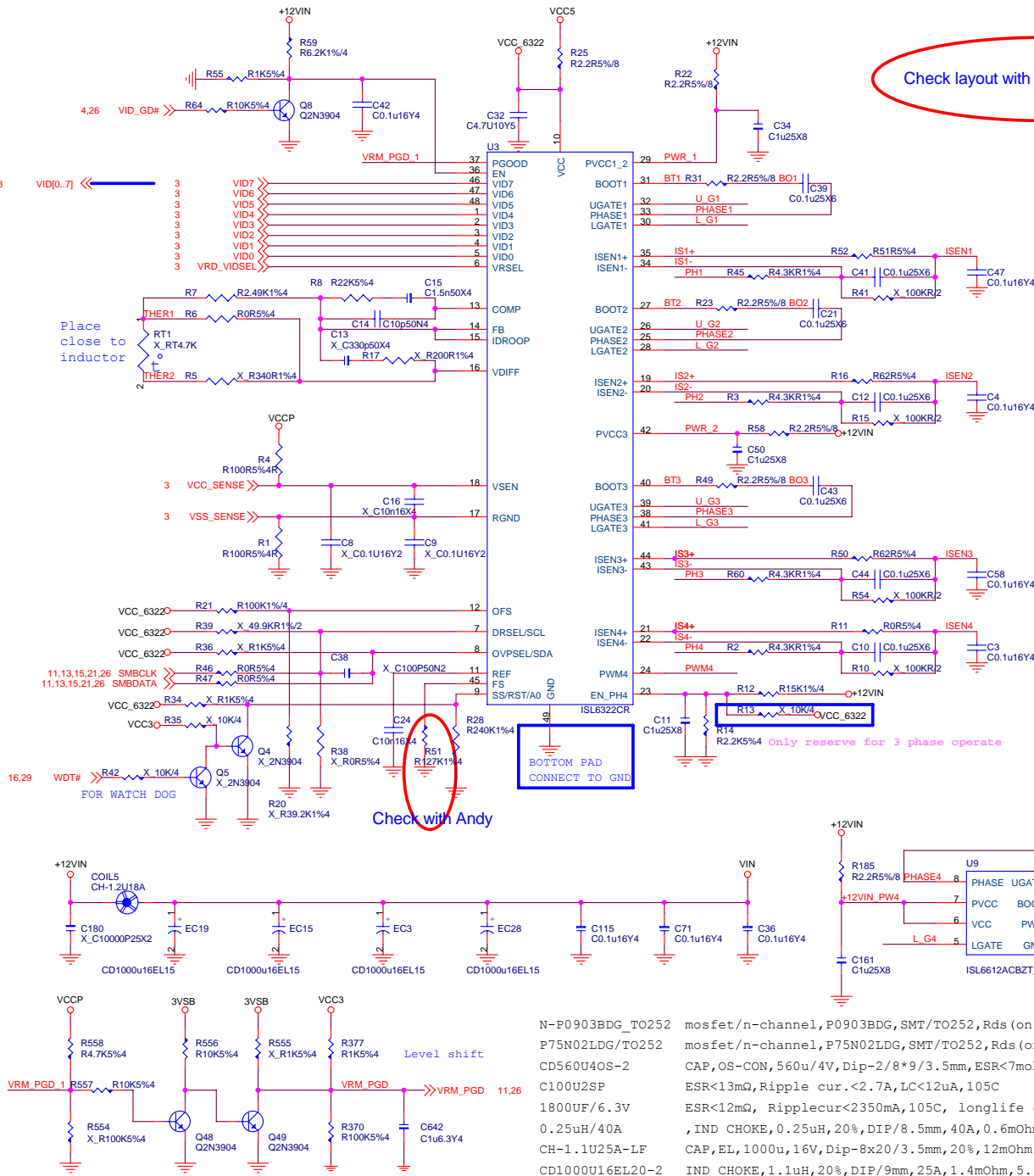
[illegible][illegible]

MS12	MS13
ATTACH:D7,U5,C83,C91,C97,R123 R128,R136,R148,R143,R154	ATTACH:R121,R138,R152,R153
DELETE: R121,R138,R152,R153	DELETE: D7,U5,C83,C91,C97,R123 R128,R136,R148,R143,R154

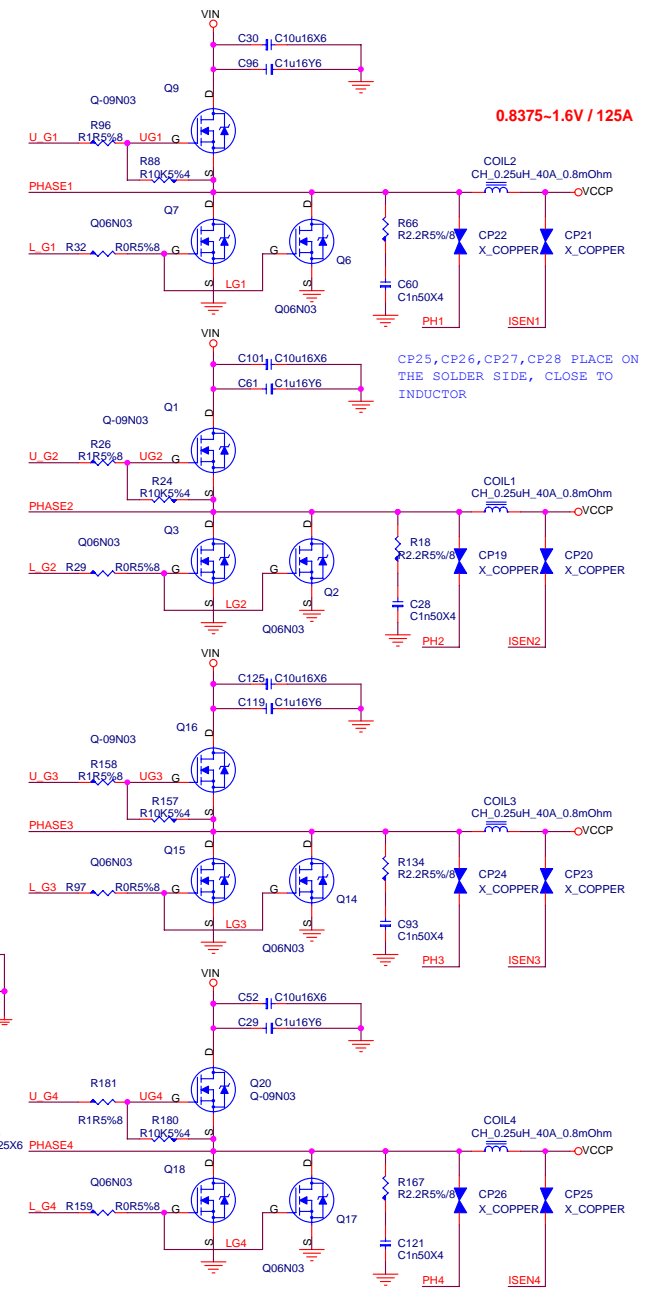


Size Custom	Document Description GMCH CORE POWER (1.25V_21.3A)	Rev 10
Date: Monday, May 28, 2007	Sheet 27 of 34	

Voltage Regular Module



Check layout with Andy for signal noise



0.8375~1.6V / 125A

CP25,CP26,CP27,CP28 PLACE ON
THE SOLDER SIDE, CLOSE TO
INDUCTOR

The schematic shows two vertical signal paths. The left path starts from a ground symbol at the bottom, goes up through a capacitor labeled C28 C1n50X4, then through a component labeled X2.2R3%8, and finally through a blue triangle component labeled CF19. The right path starts from a red label ISEN2 at the bottom, goes up through a blue triangle component labeled X_COPPER, and finally through another blue triangle component labeled CF20. Both paths terminate at a common top rail.

COIL4
CH_0.25uH_40A_0.8mOhm

V_{GS}=±20V, RoHS compliance
V_{GS}=±20V, RoHS compliance

RO-STAR INT'L CO., LTD

MS-7359		
Content Description		Re
1-ISL6322 4-phase		
28, 2007	Sheet 28 of 34	
1		



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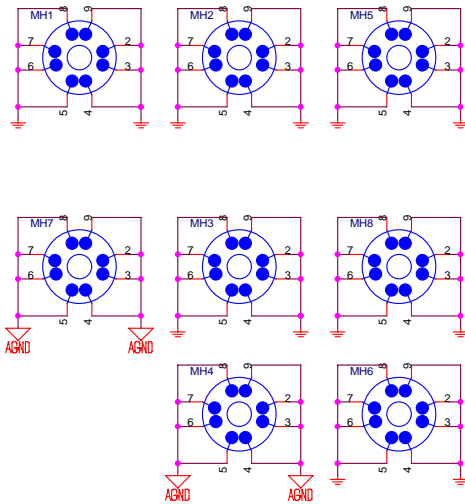
MS-7359

Size Custom	Document Description VRD11-ISL6322 4-phase
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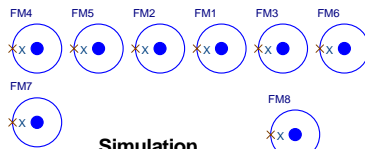
Rev
10

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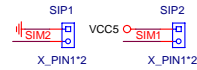
Mounting Holes



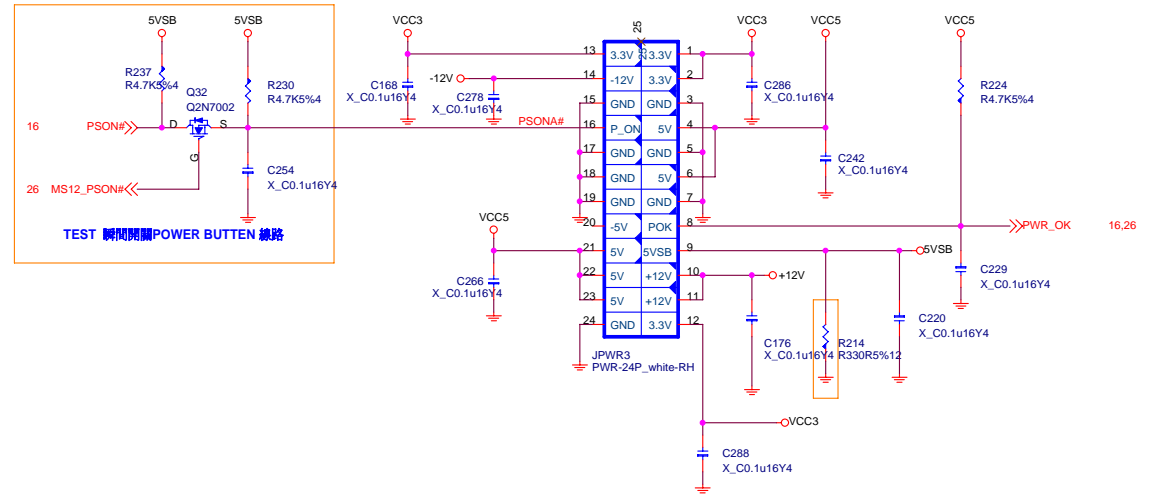
Optical Fiducial Marks-120



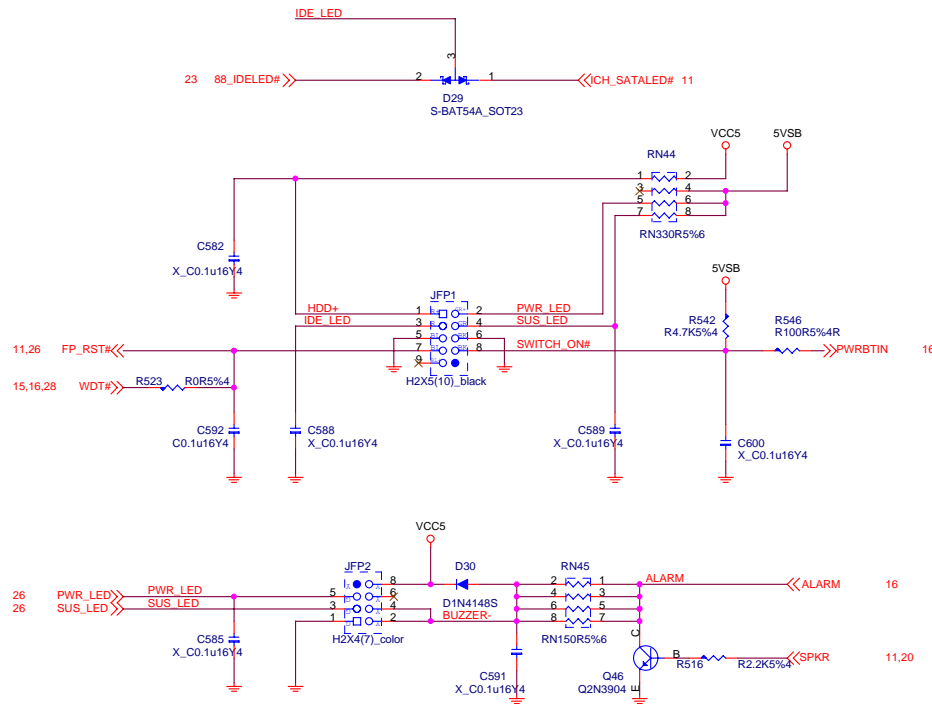
Simulation



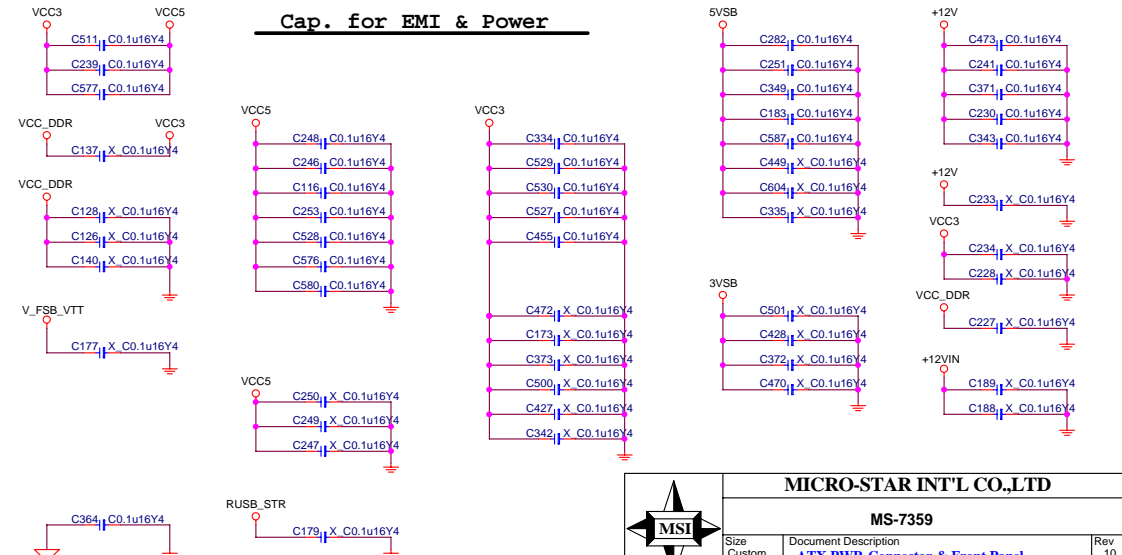
ATX POWER CONNECTOR



FRONT PANNEL



Cap. for EMI & Power



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Size	Document Description	Rev
Custom	ATX PWR-Connector & Front Panel	10
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