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NEC:ROPROS

MS-7410 uATX

Version: 0C

CPU: Intel, Socket 775 (Intel Core 2 Duo Processors, Intel Pentium D Processors, Intel Pentium 4 Processors, Intel Celeron D Processors)--65-95 watts Intel Core 2 Duo, Pentium D, Celeron D

System Chipset:

Intel Bearlake - Q (North Bridge)
Intel ICH9 Series (South Bridge)
ROPROS-MA use ICH9 / ROPROS-VS use ICH9DH / ROPROS-NECCAP use ICH9R

On Board Device:

CLOCK Gen -- SLG84516BT CLK Gen.
LPC Super I/O -- SCH5617
LAN -- Broadcom-BCM5787M LAN -- INTEL 82566 (Support ViiV)
HD Audio Codec -- ALC262 VER:C2
TPM - SLB9635

Main Memory:

Dual-channel DDR-II * 4

Expansion Slots:

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

PWM: VRD11 Intersil 6312 3Phase

How to distinguish the different SKU

BLUE Color which mean all model need use
PURPLE Color which mean ROPROS-MA/VS use
SKY BLUE Color which mean ROPROS-MA/NECCAP use
ORANGE Color which mean ROPROS-MA use
PINK Color which mean ROPROS-VS
GREEN Color which mean ROPROS-NECCAP
BROWN Color which mean the part reserve

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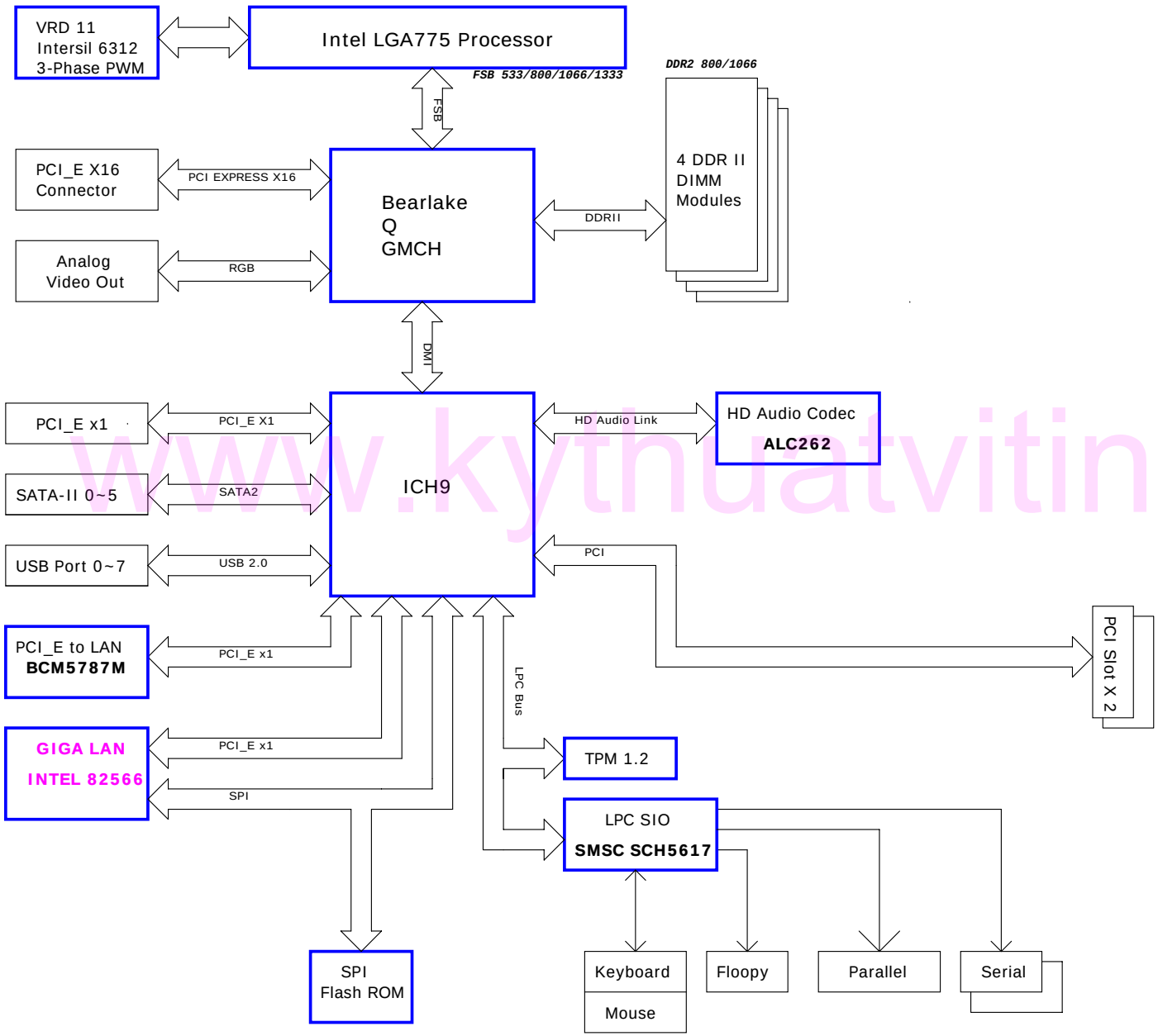
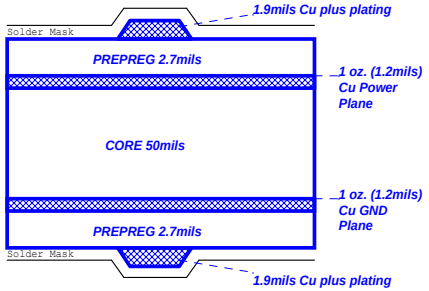
Block Diagram



Board Stack-up

(1080 Prepreg Considerations)



Single End 50ohm Top/Bottom : 4mils
USB2.0 - 90ohm : 15/7.5/4.5/7.5/15
SATA - 95ohm : 15/8/4/8/15
LAN - 100ohm : 15/10/4/10/15
PCIE - 95ohm : 15/8/4/8/15

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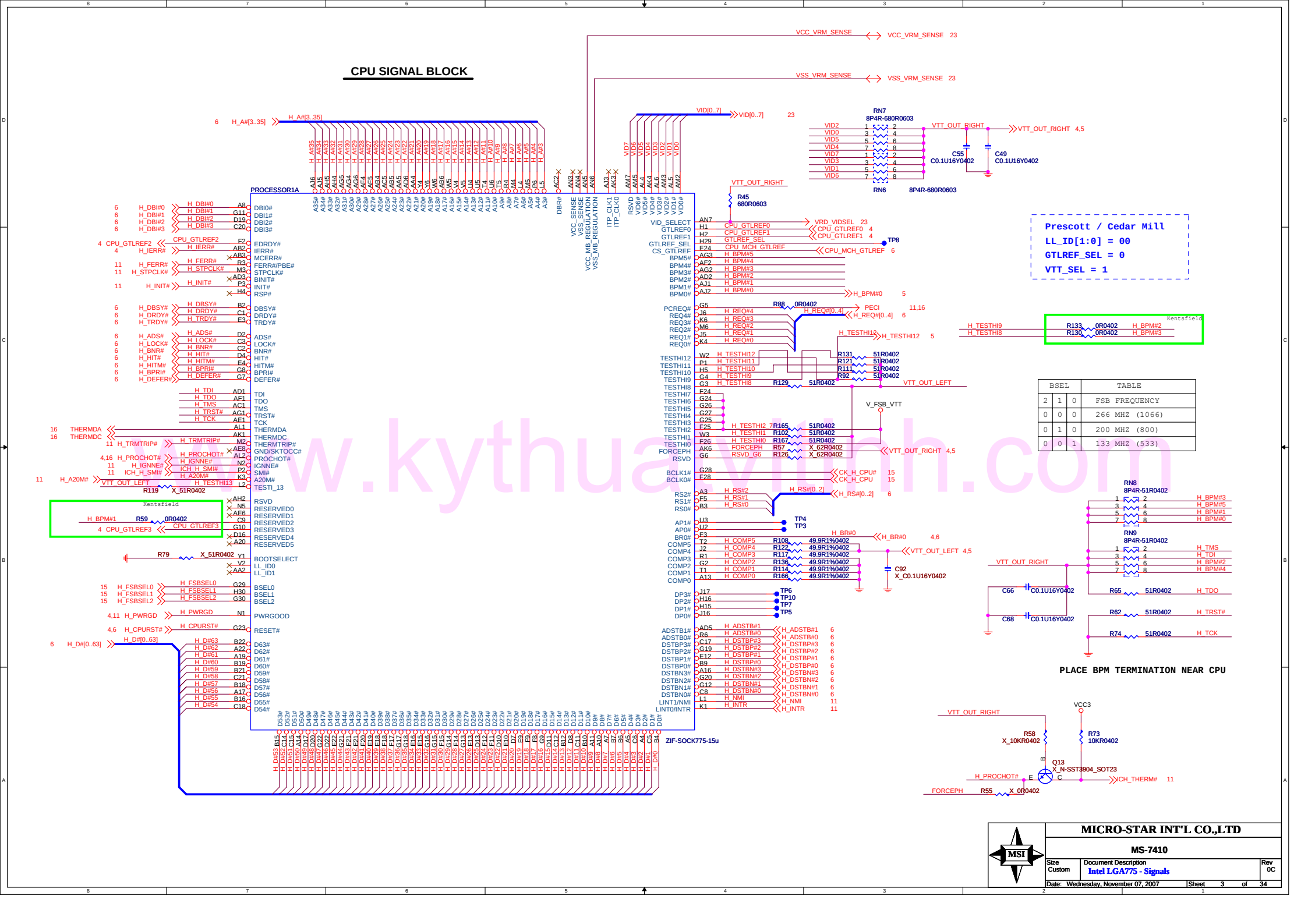
CPU SIGNAL BLOCK



BSEL			TABLE
2	1	0	FSB FREQUENCY
0	0	0	266 MHZ (1066)
0	1	0	200 MHZ (800)
0	0	1	133 MHZ (533)

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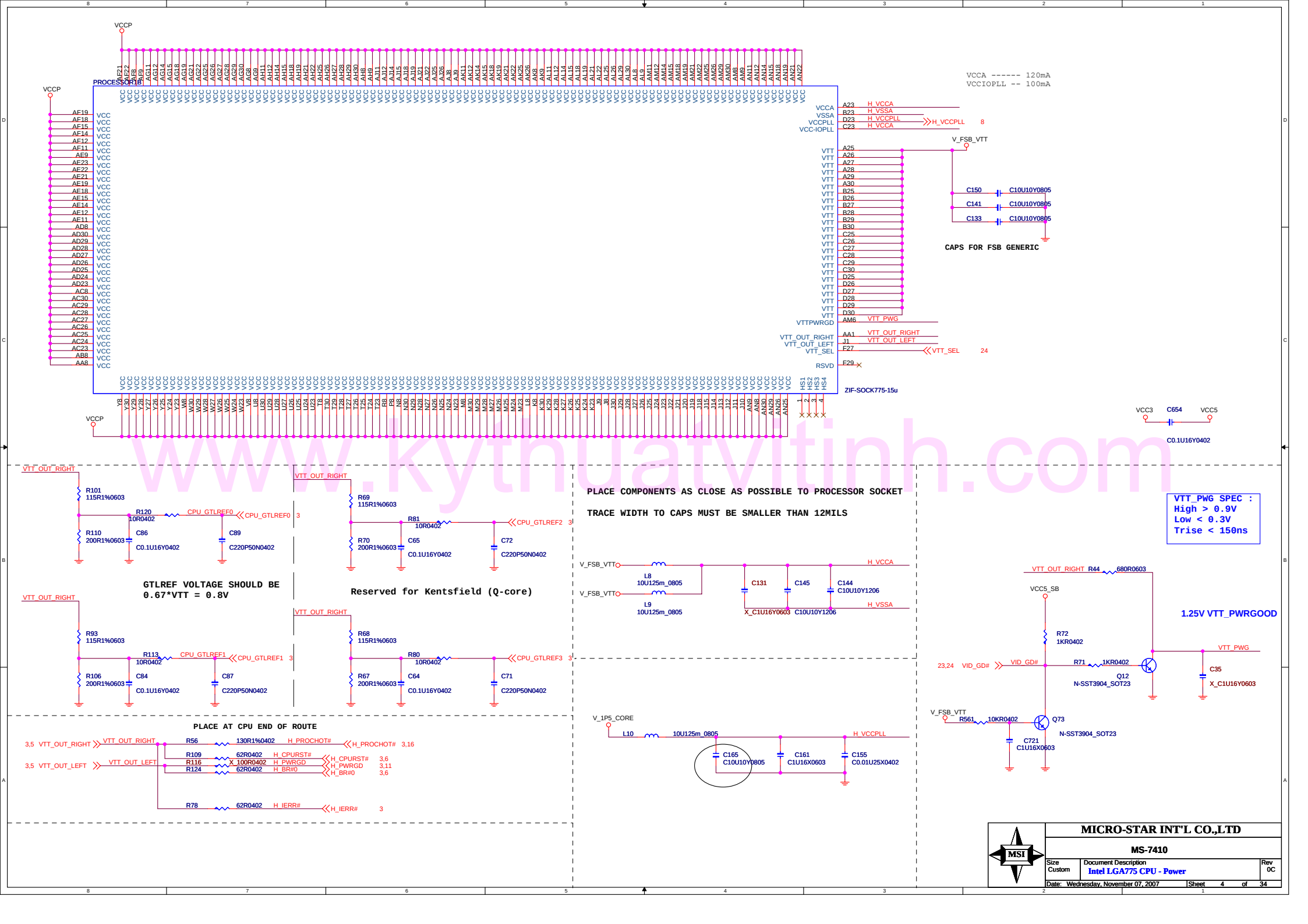

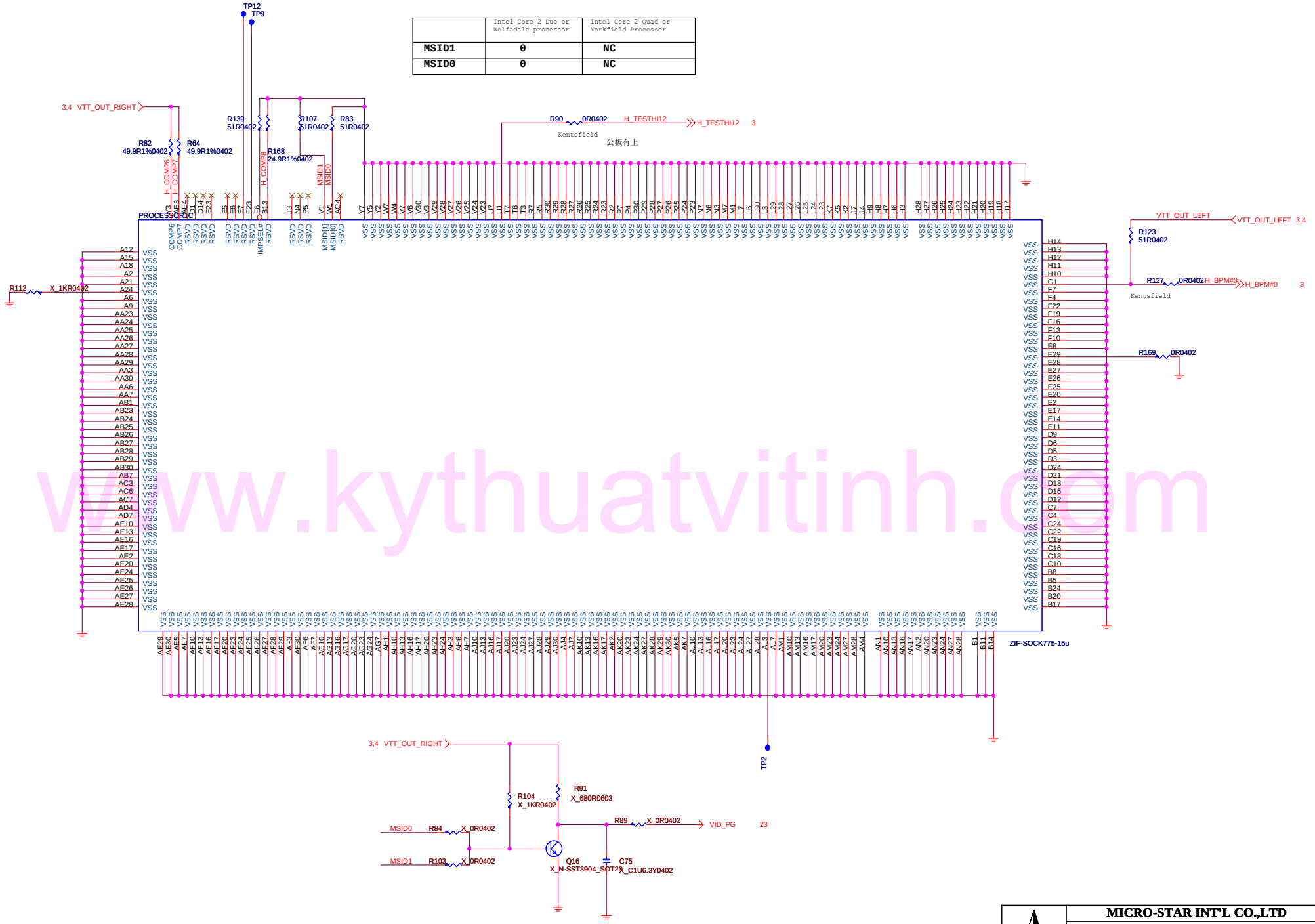

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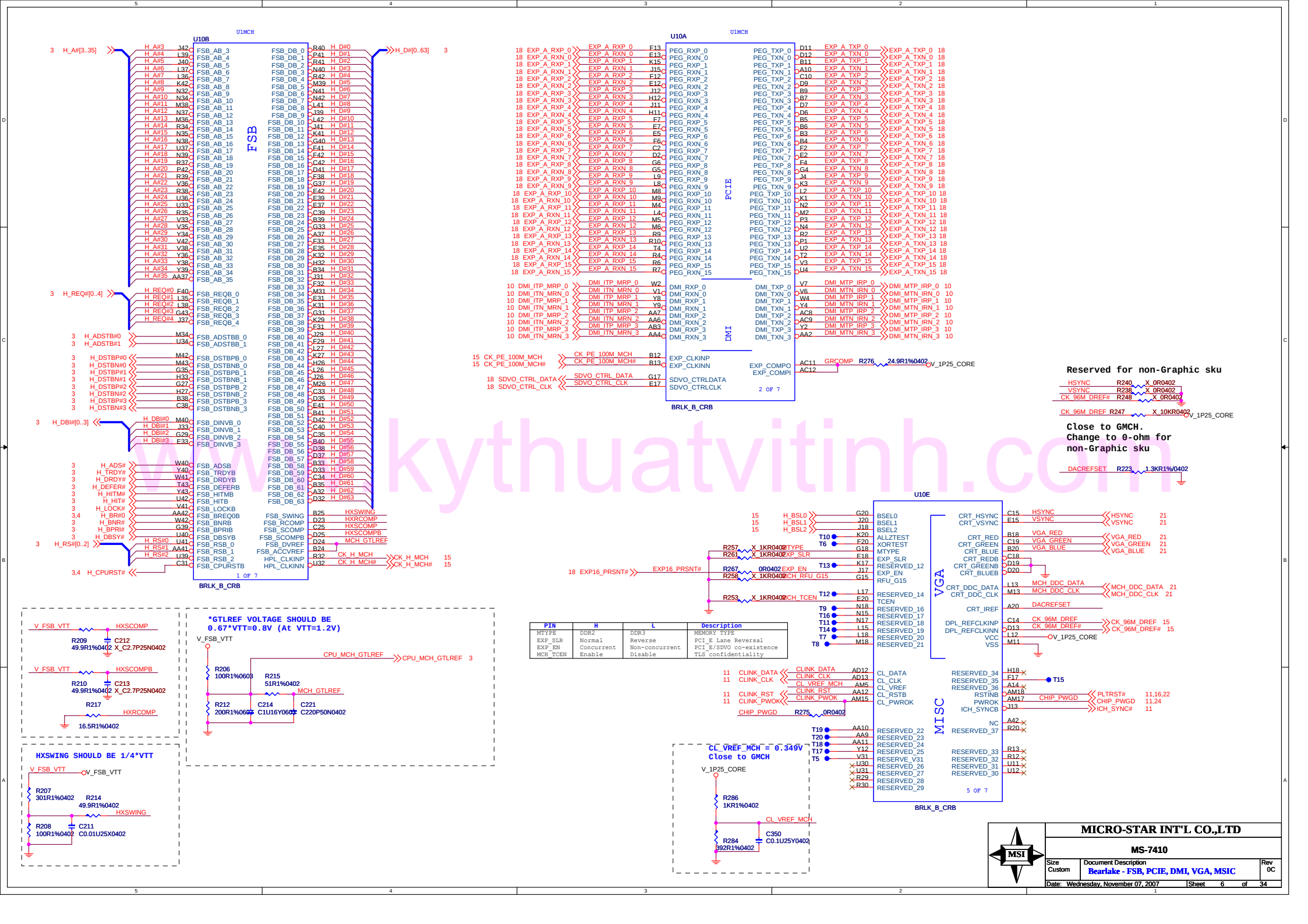

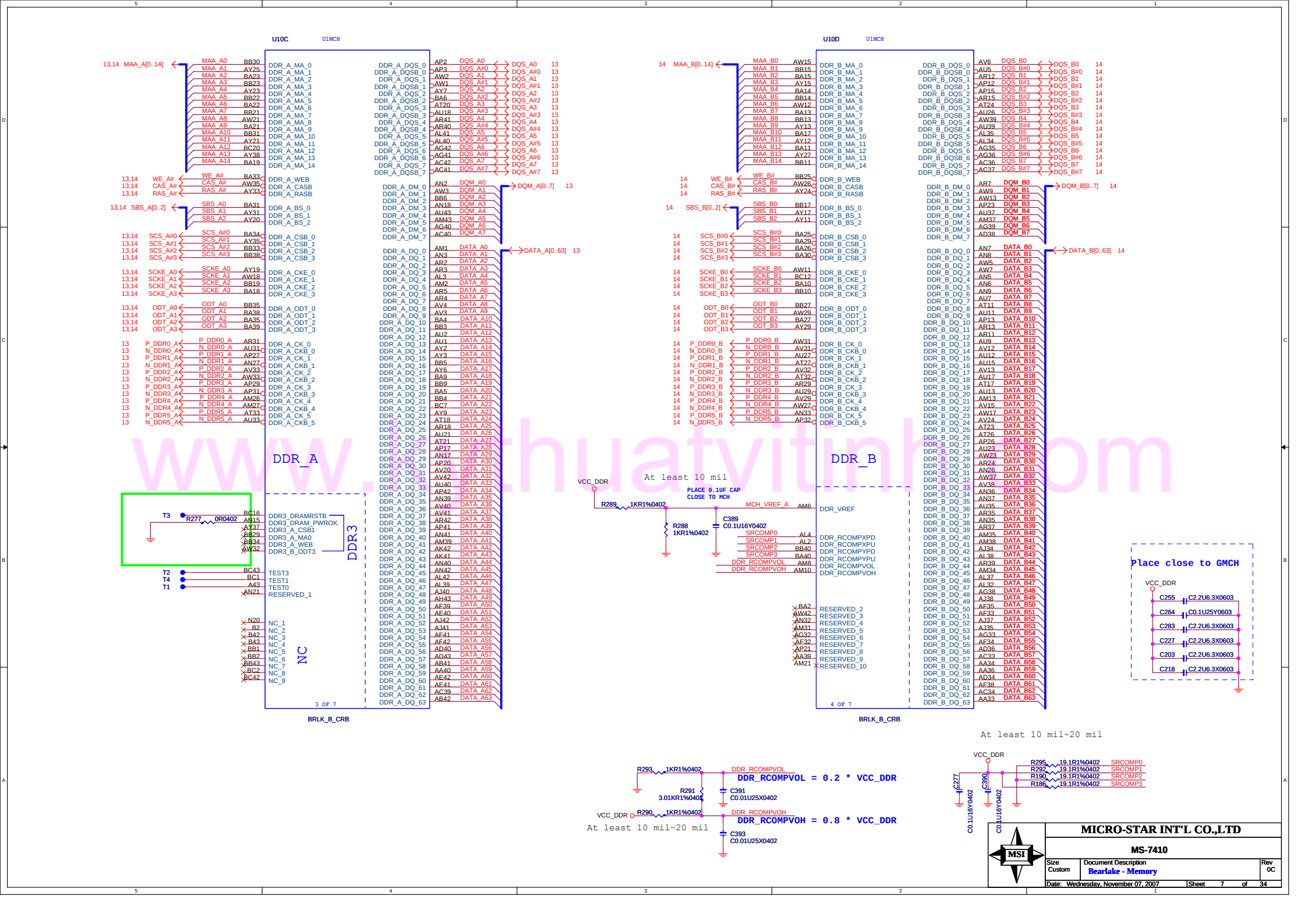

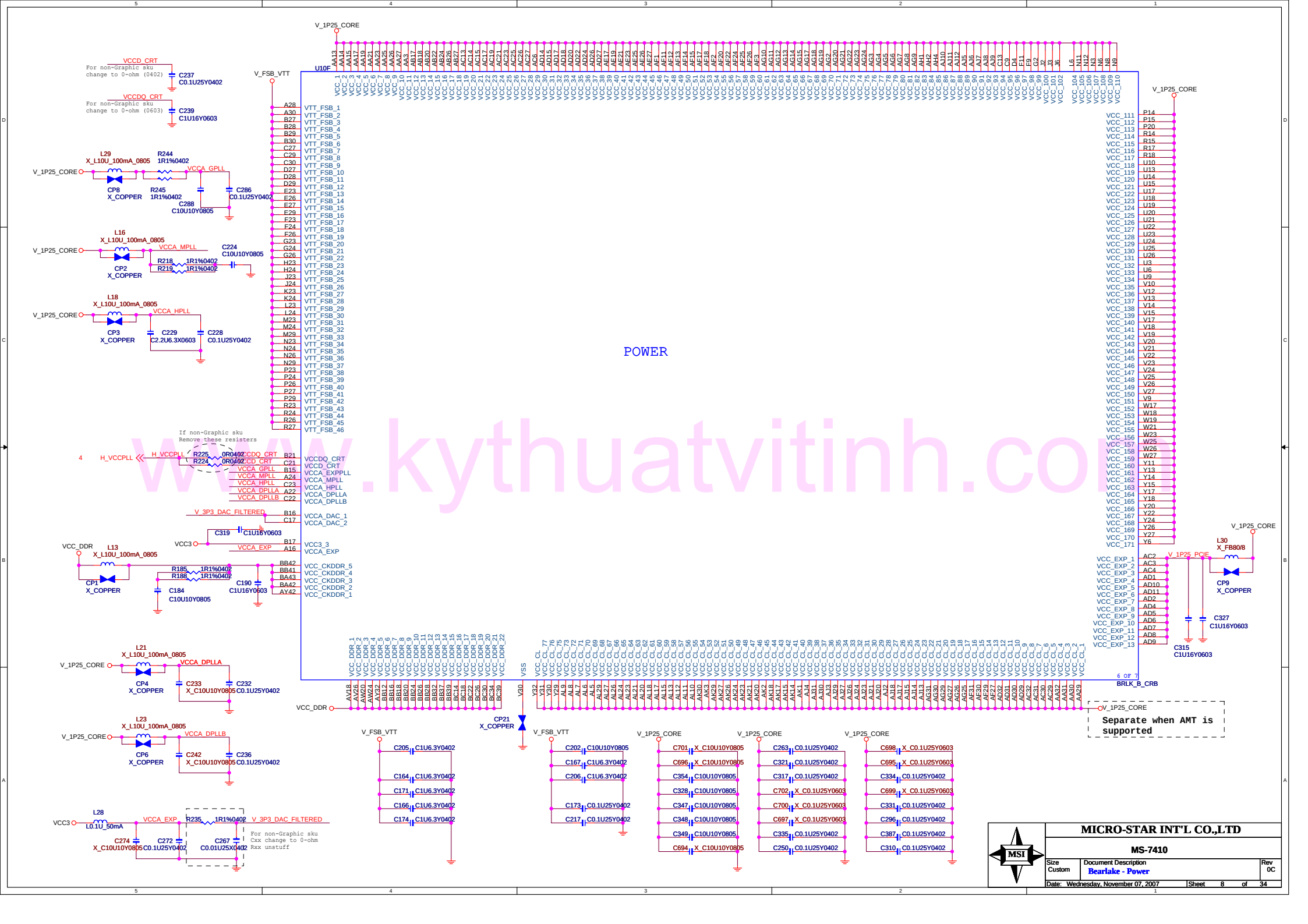

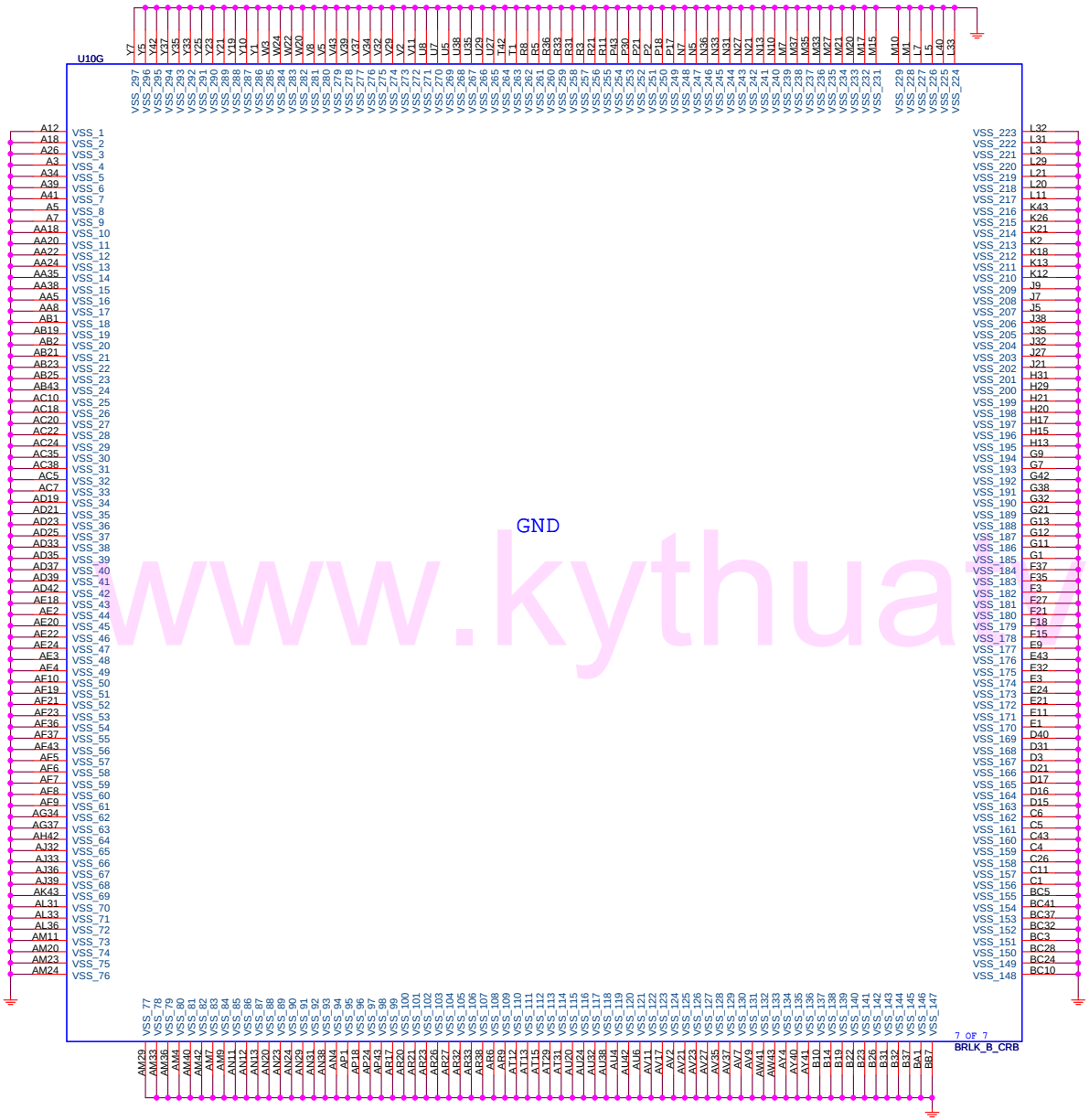

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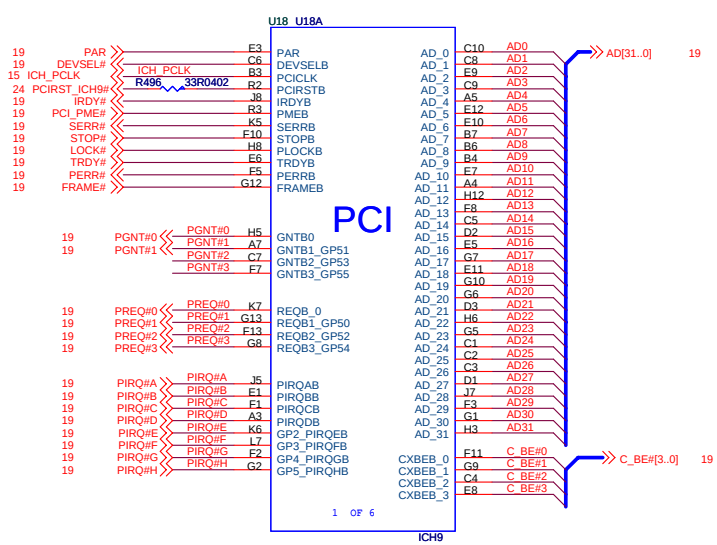
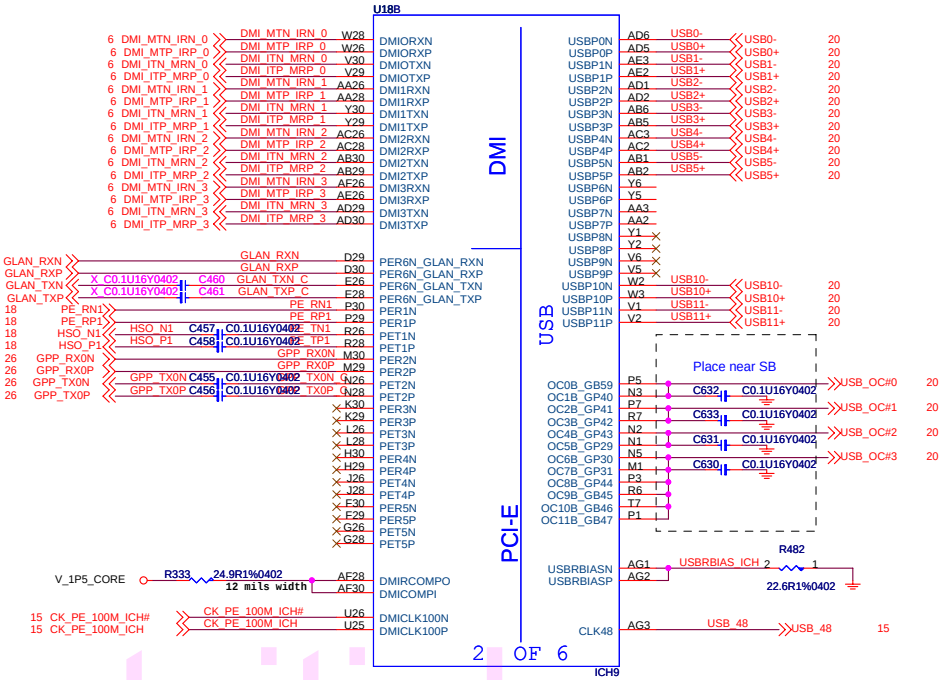
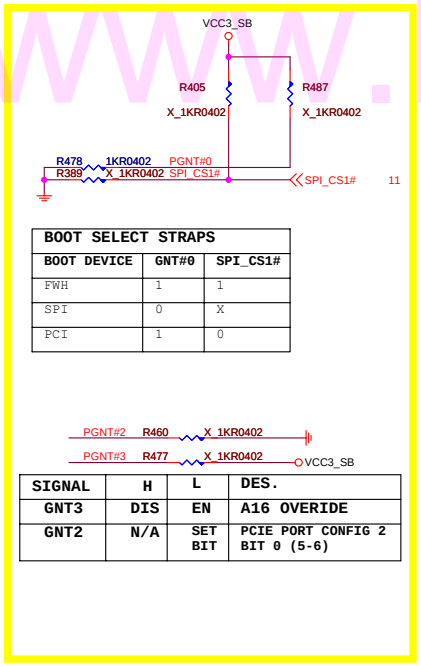






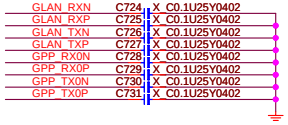
BOOT SELECT STRAPS

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

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

ICH9 H/W STRAPS

SIGNAL	H	L	DES.
SPKR	DIS	EN	REBOOT
GNT3	DIS	EN	A16 OVERIDE
INTVRMEN	EN	DIS	INT VRM
SATALED	NORM	REVERSE	PCIE 0-3 ORDER
HDA_SDOUT	DFX/ PCIE	N/A	XOR MODE/PCIE PORT CONFIG BIT 1
HDA_SYNC	SET BIT	N/A	PCIE PORT CONFIG BIT 0 (1-4)
GNT2	N/A	SET BIT	PCIE PORT CONFIG 2 BIT 0 (5-6)



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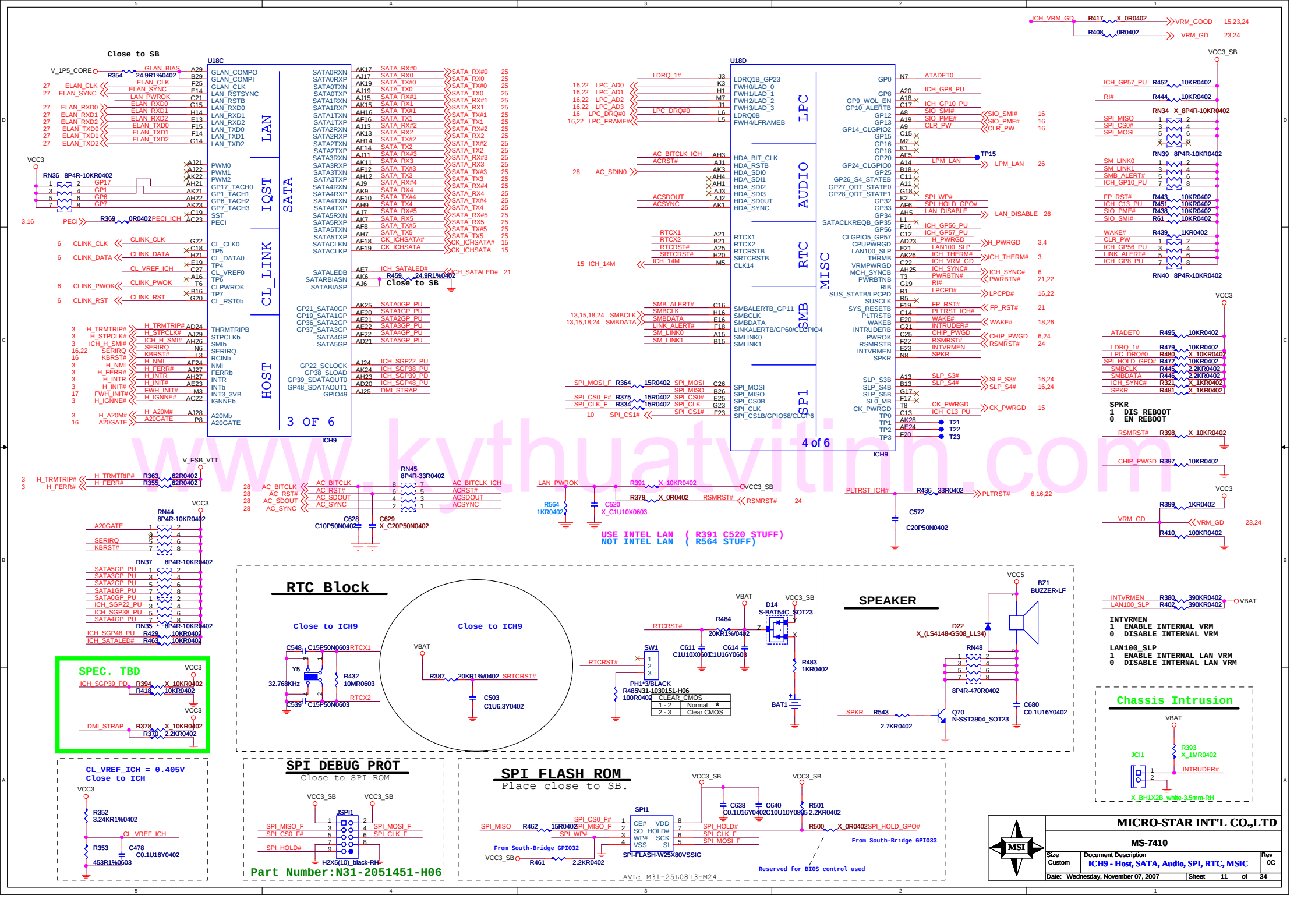

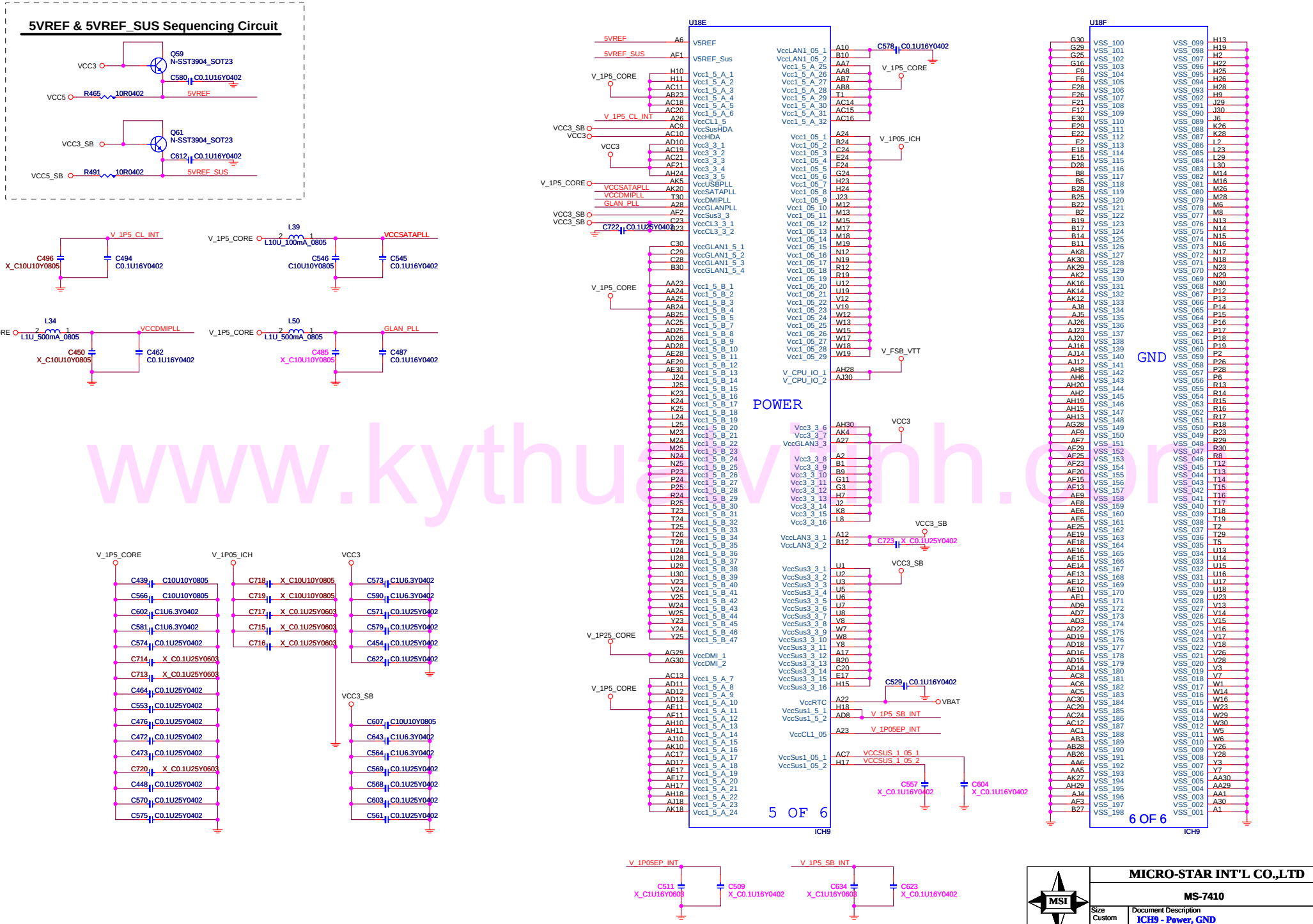

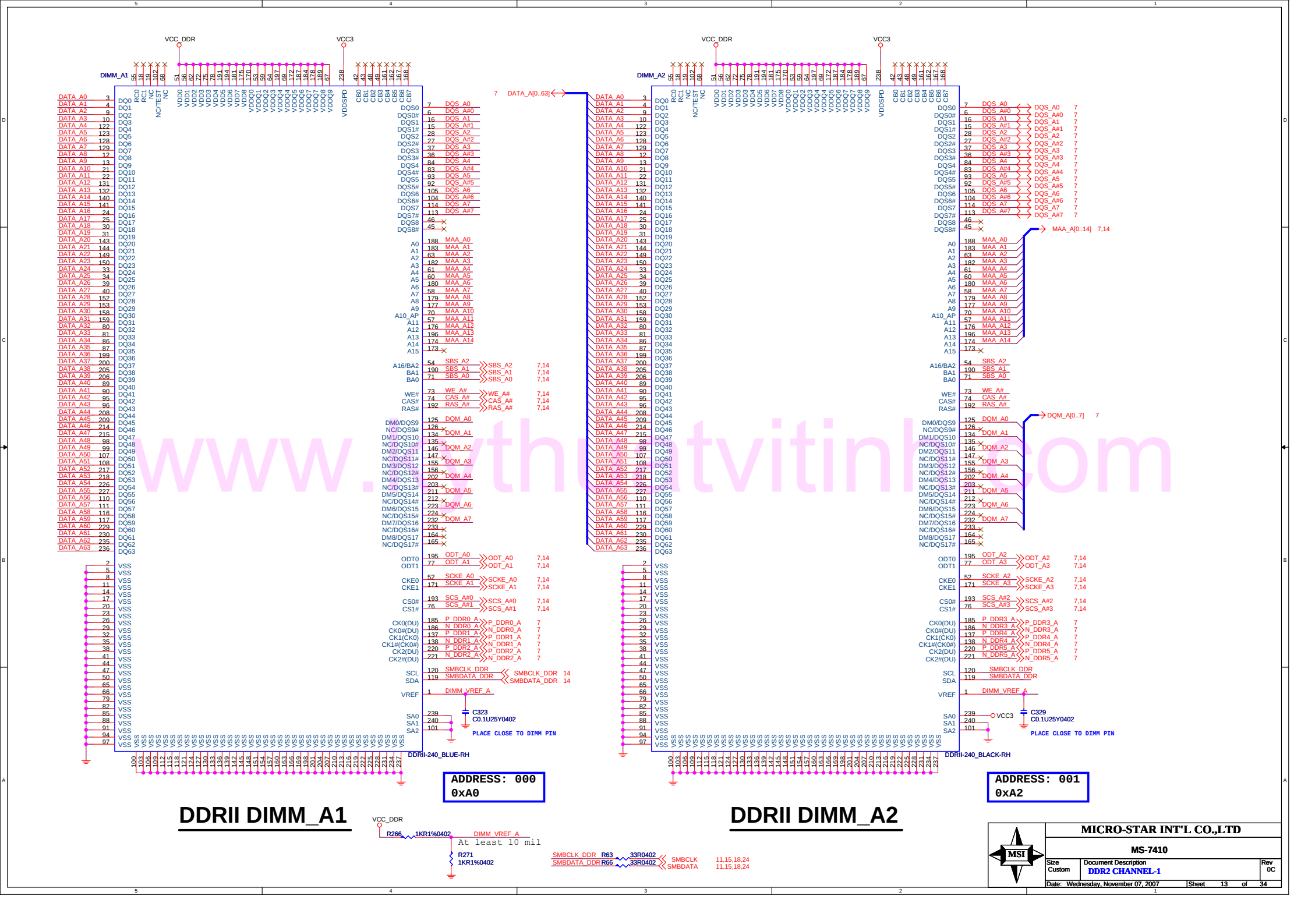
DIMM_A1
DDRII-240_BLUE-RH
DDRII DIMM_A1
ADDRESS: 000
0xA0
DIMM_A2
DDRII-240_BLACK-RH
DDRII DIMM_A2
ADDRESS: 001
0xA2
VCC_DDR
VCC3
DATA_A[0..63]
MAA_A[0..14]
DQM_A[0..7]
SMBCLK_DDR
SMBDATA_DDR
DIMM_VREF_A
C323
C0.1U25Y0402
C329
PLACE CLOSE TO DIMM PIN
R266
1KR1%0402
R271
At least 10 mil
R63
R66
33R0402
SMBCLK
SMBDATA
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Size
Custom
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DDR2 CHANNEL-1
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0C
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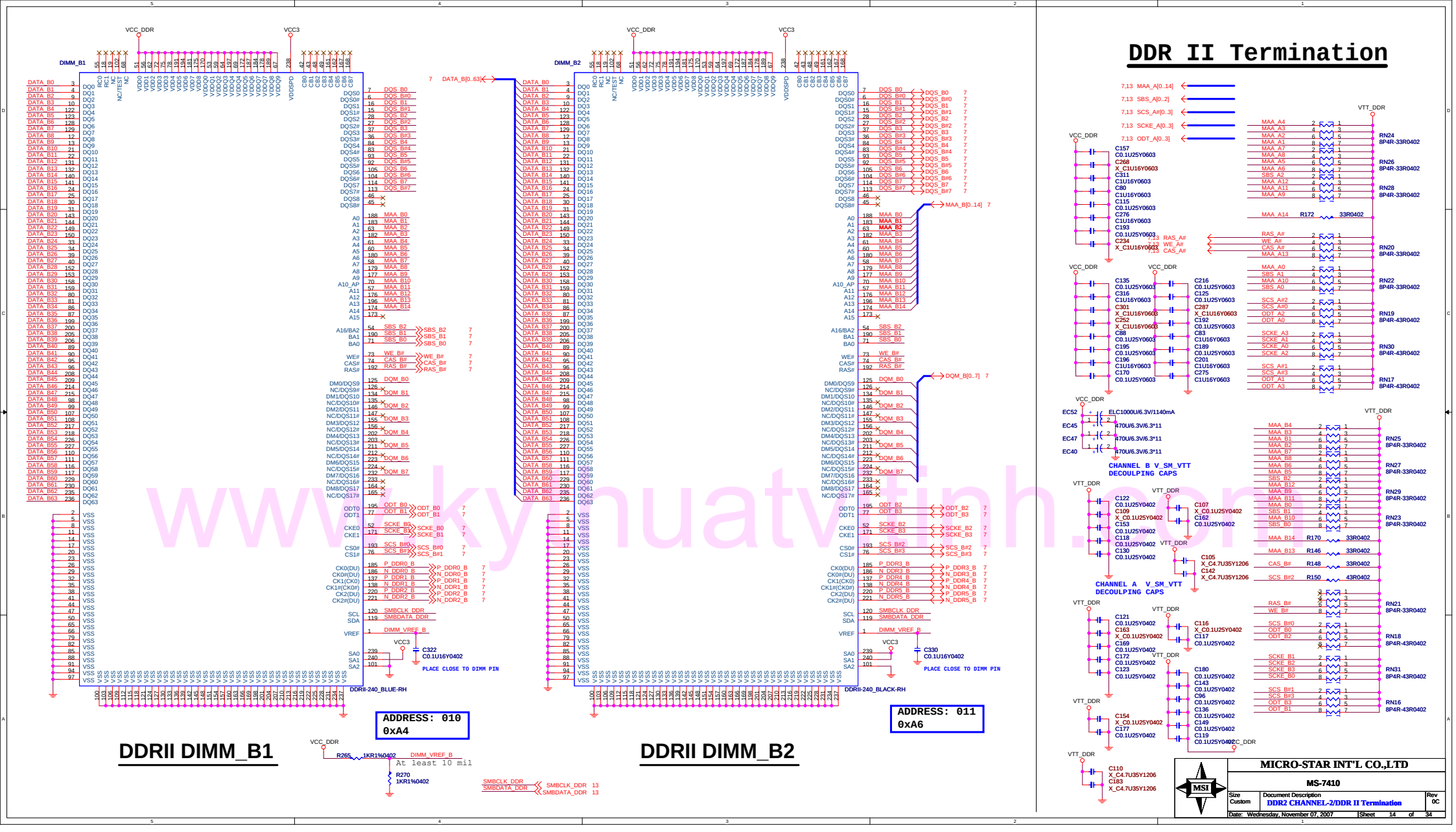
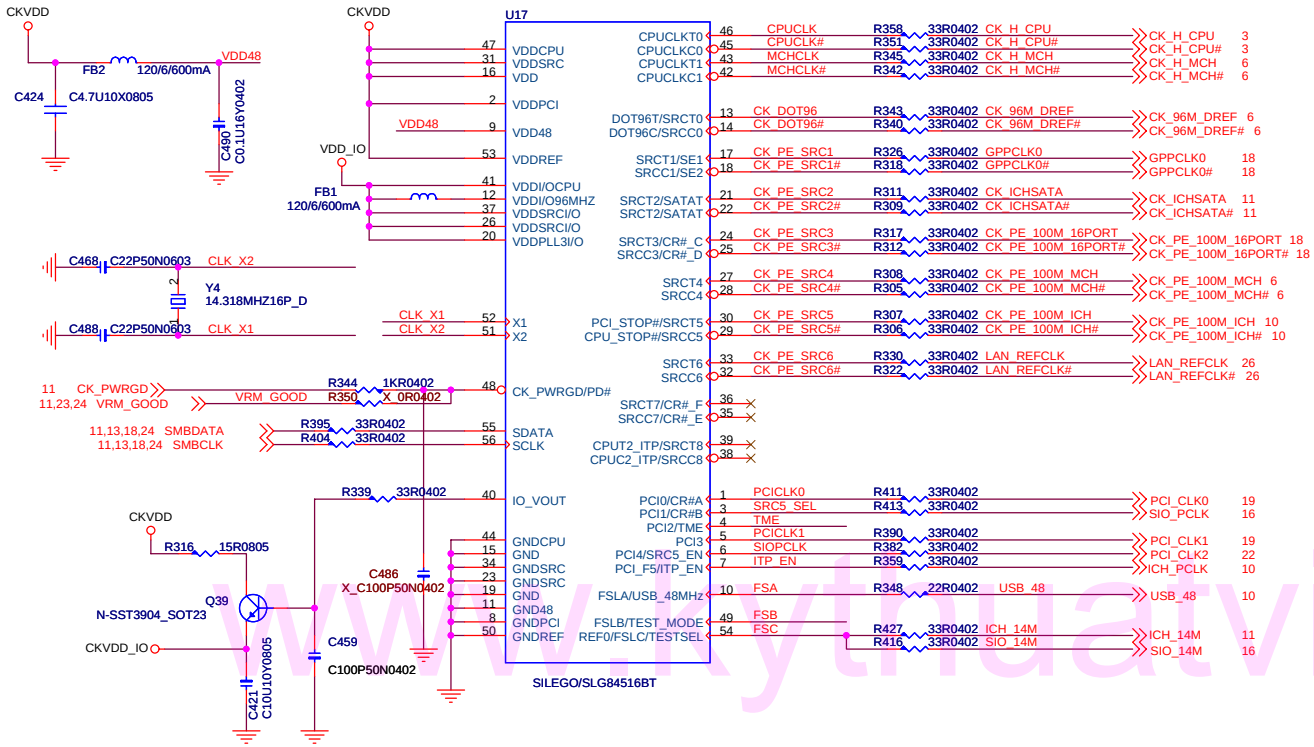
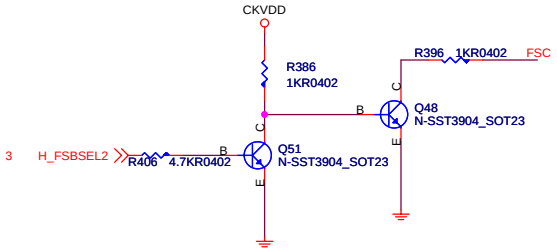
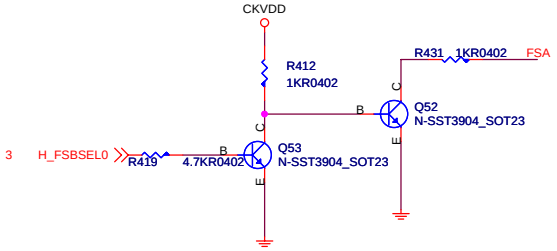
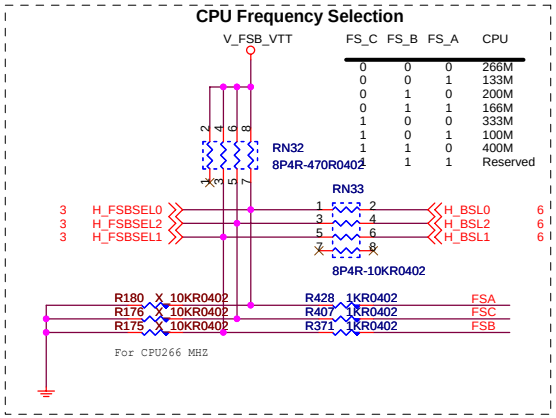


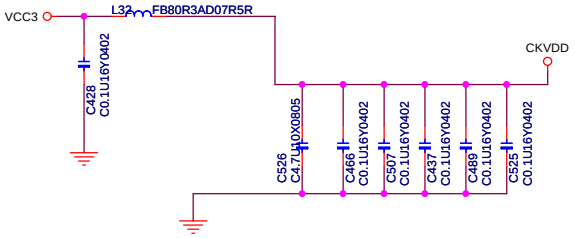
Clock Generator -SILEGO/SLG84516BT

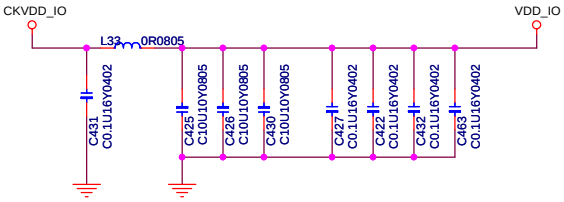




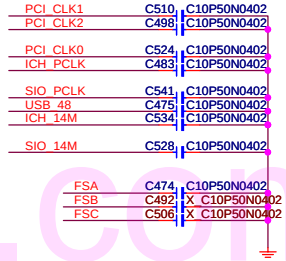


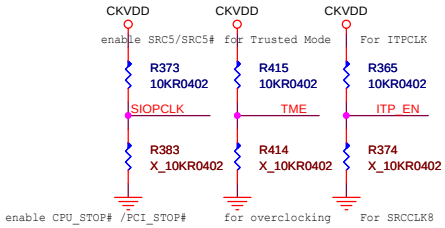






EMC HF filter capacitors, located close to PLL





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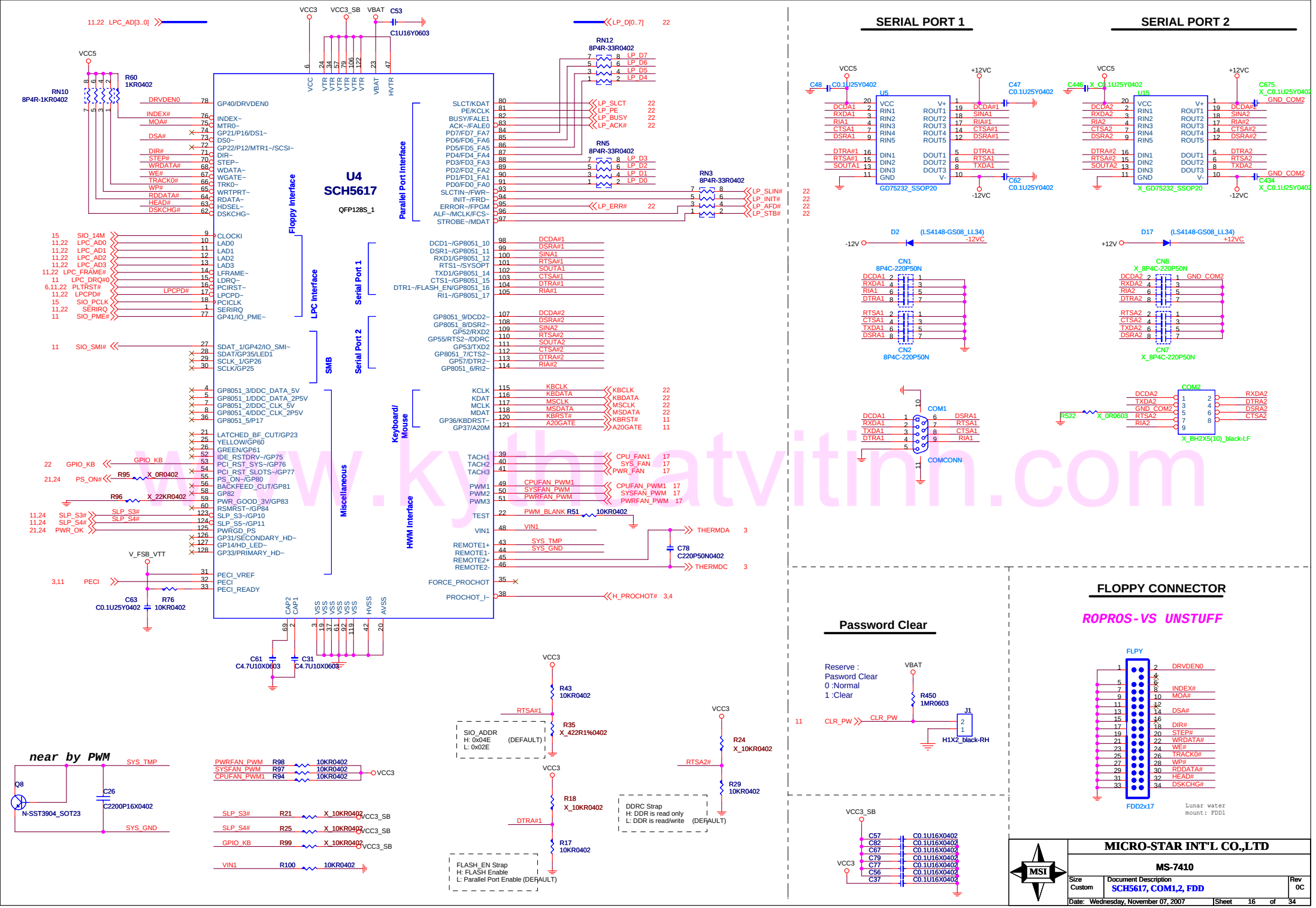
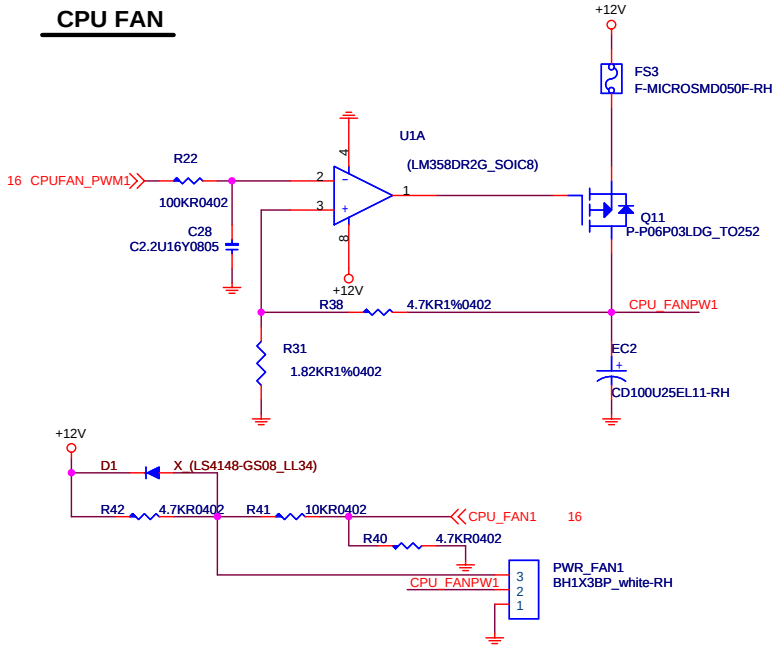
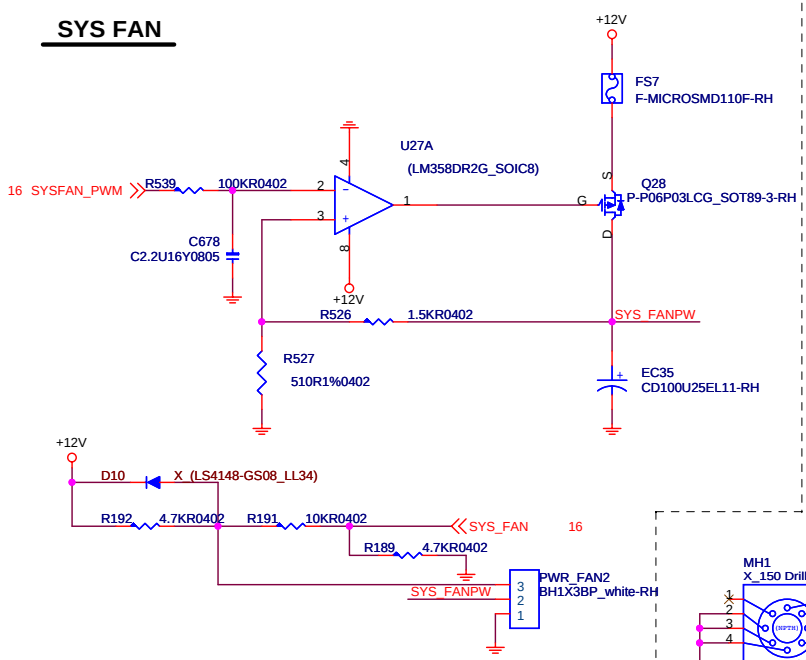


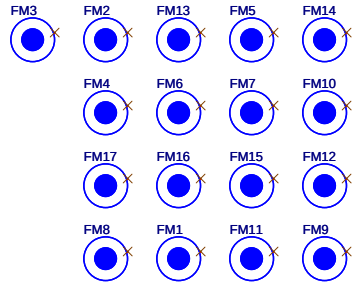
CPU FAN



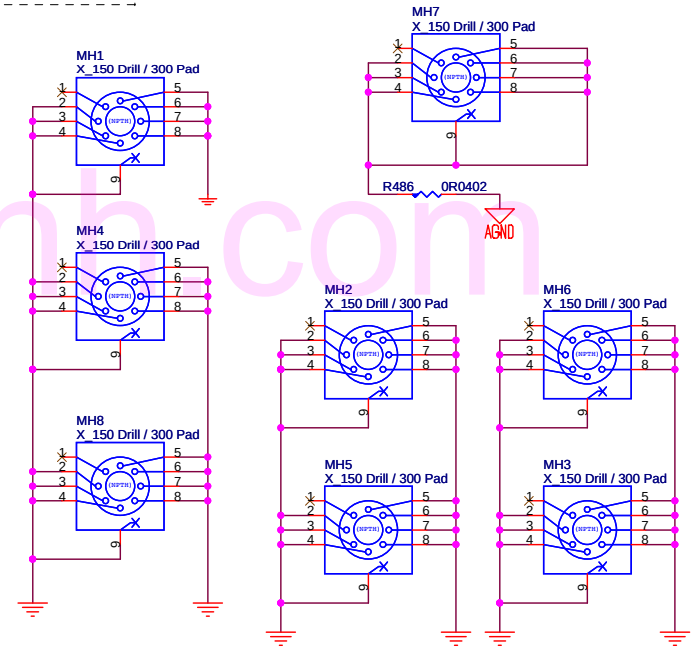
SYS FAN



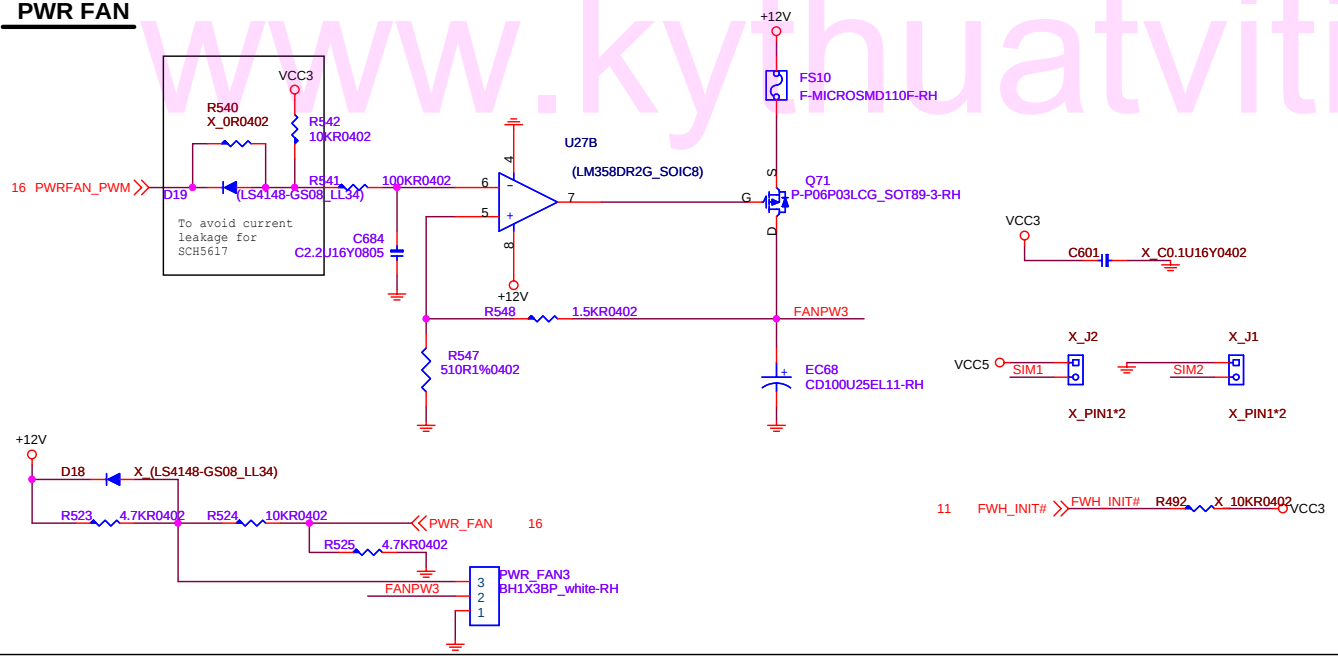
Optical Fiducial Marks



Mounting Holes



PWR FAN



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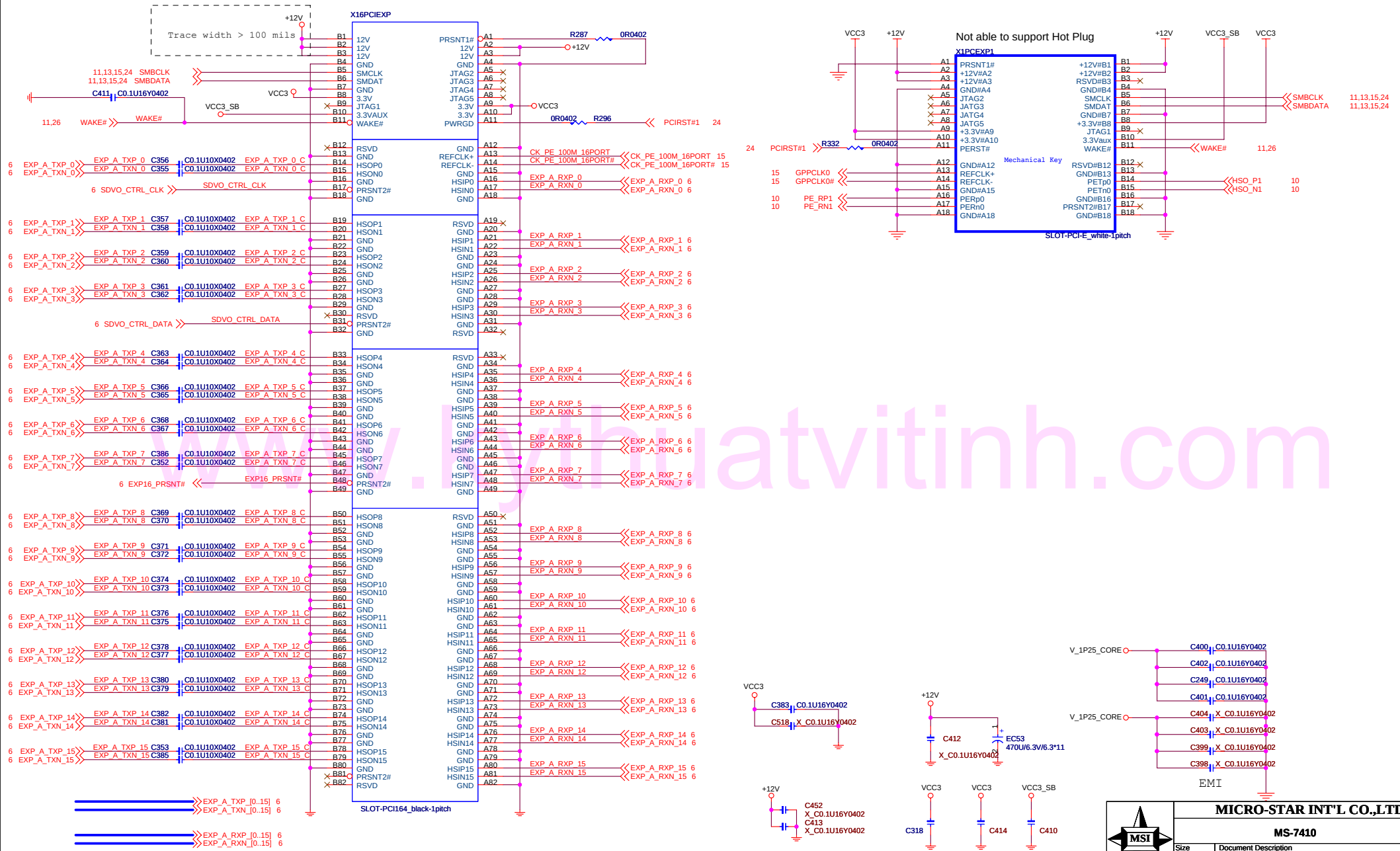
PCI EXPRESS 16-PORT



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MS-7410		
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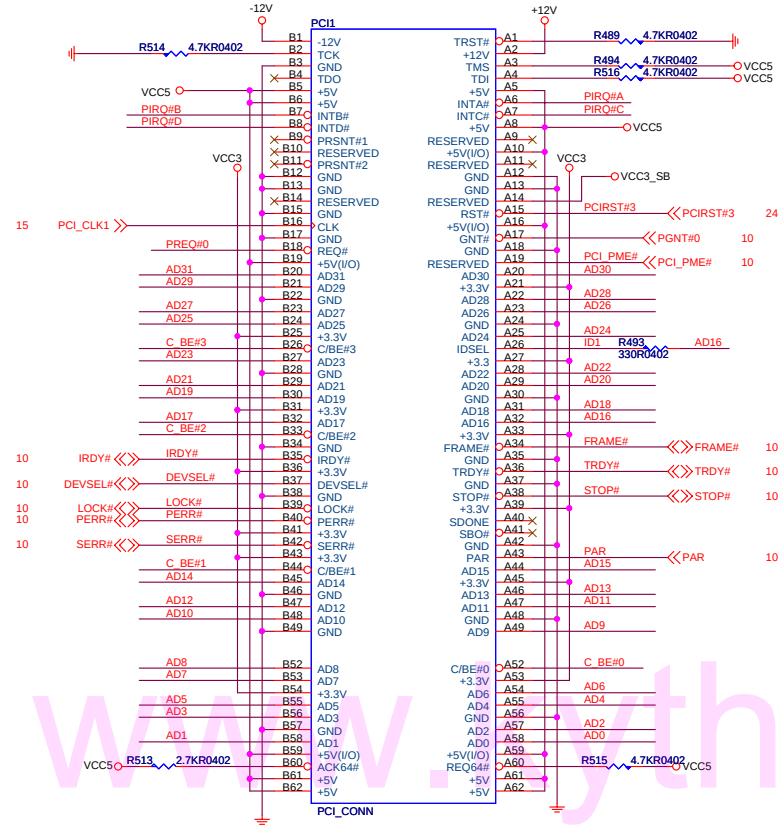
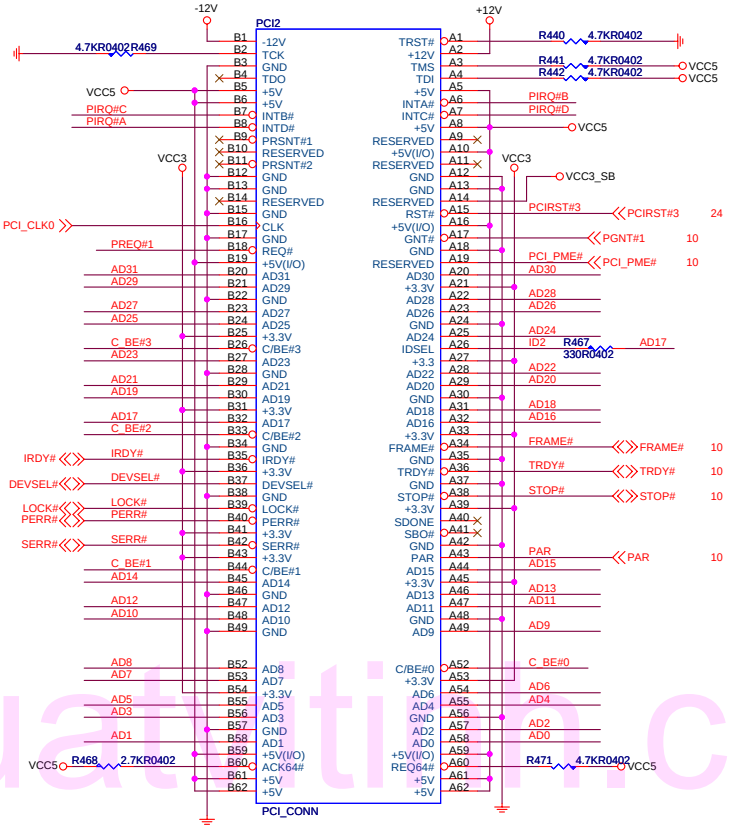
PCI SLOT 1 (PCI VER: 2.2 COMPLY)



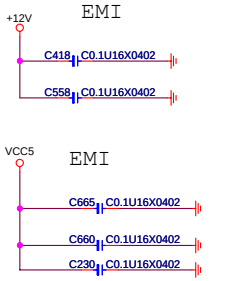
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

PCI SLOT 2 (PCI VER: 2.2 COMPLY)

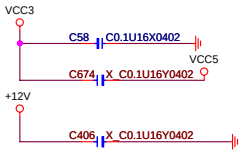


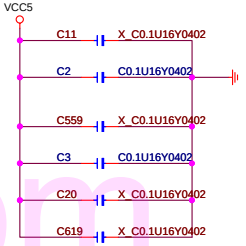
IDSEL = AD17
MASTER = PREQ#1
PIRQ#B

EMI

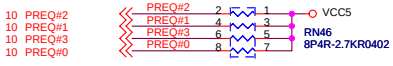


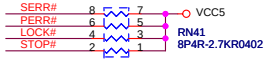
EMI

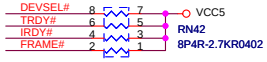




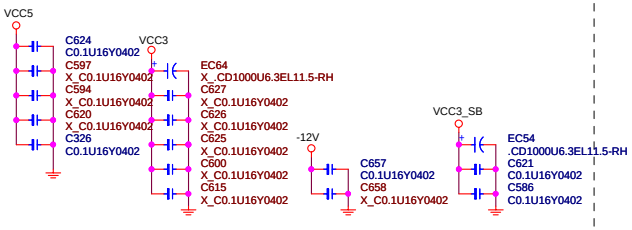
PCI PULL-UP / DOWN RESISTORS



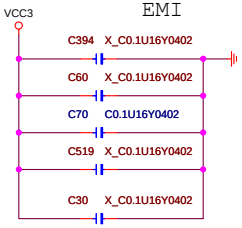


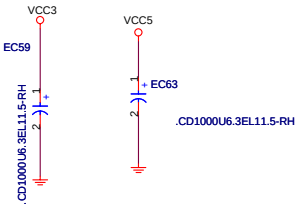


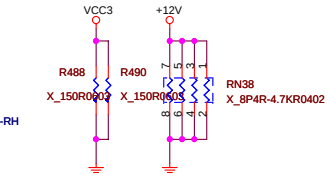
PCI SLOT DECOUPLING CAPACITORS



EMI







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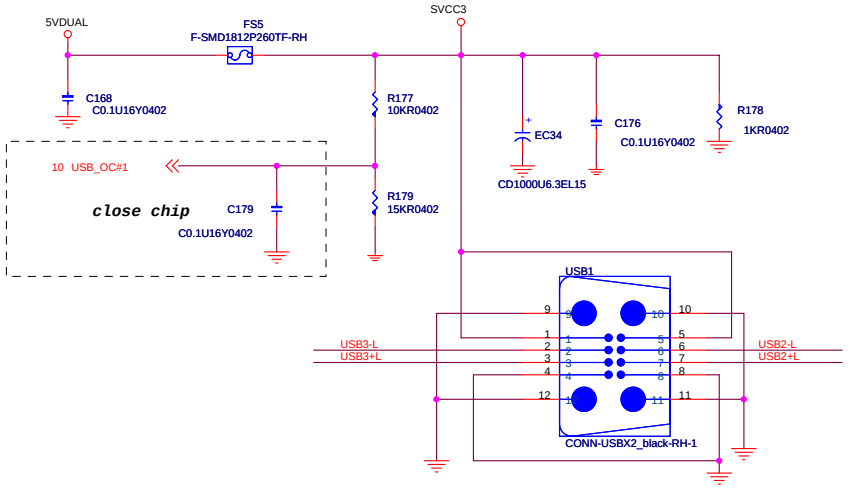
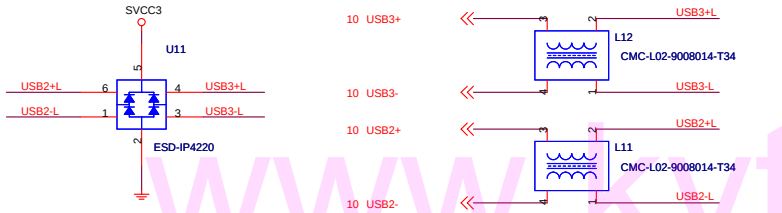
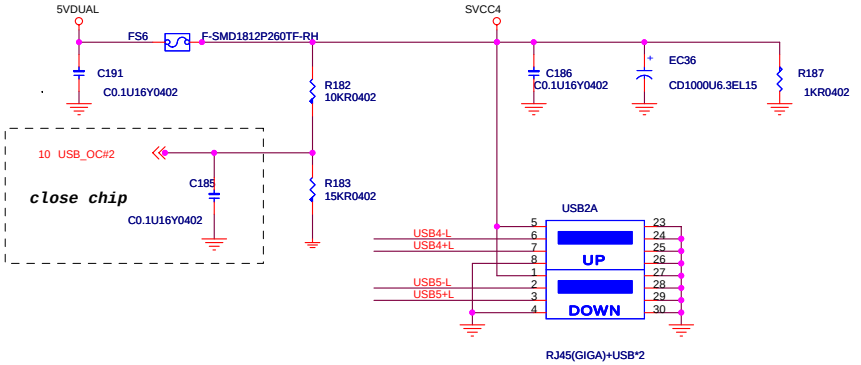
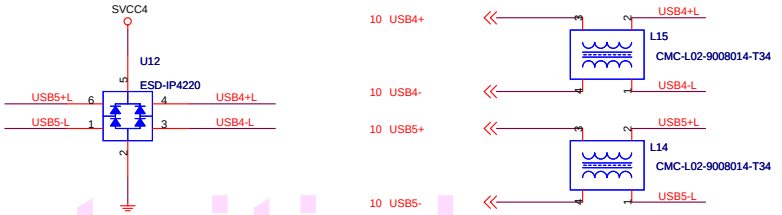
REAR PANEL USB CONNECTOR FOR USB PORT 2,3



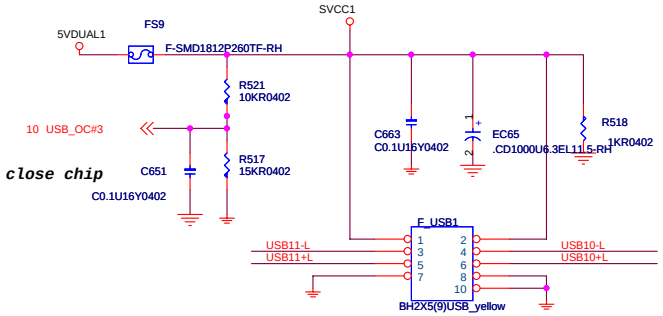


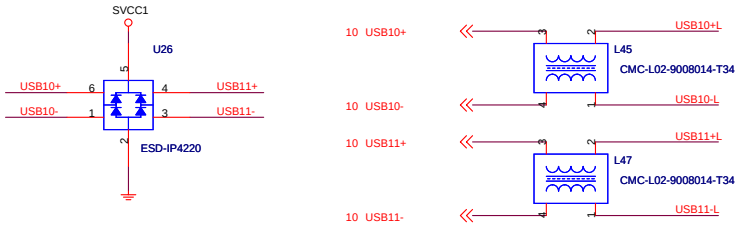
REAR PANEL USB CONNECTOR FOR USB PORT 4,5



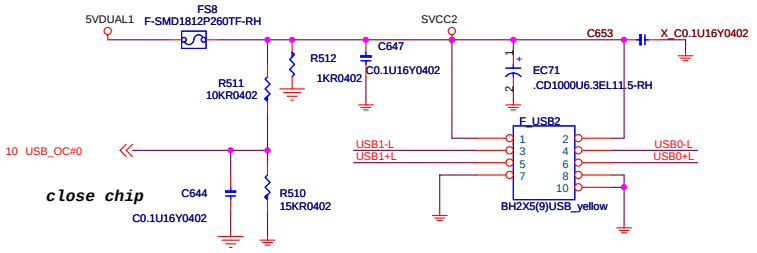


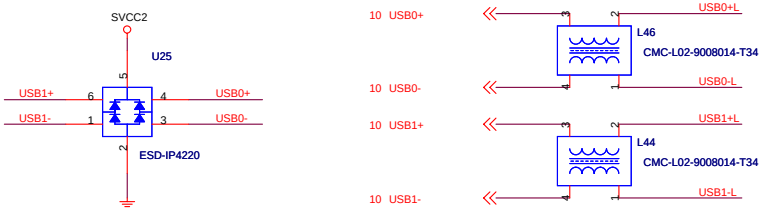
Front USB PORT 10,11 (right angel type)





Memory card reader USB CONNECTOR FOR USB PORT 0,1





MICRO-STAR INT'L CO.,LTD

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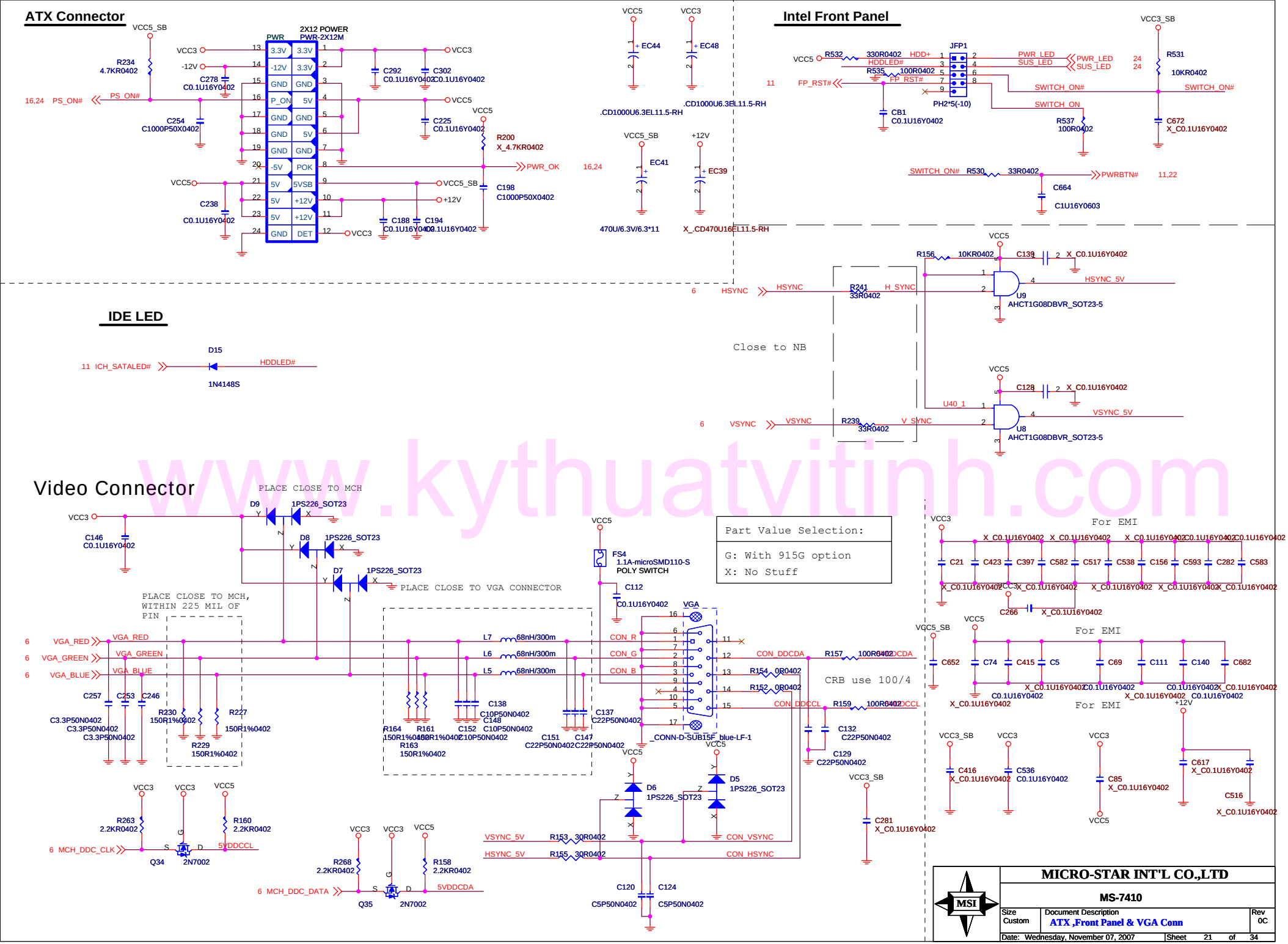
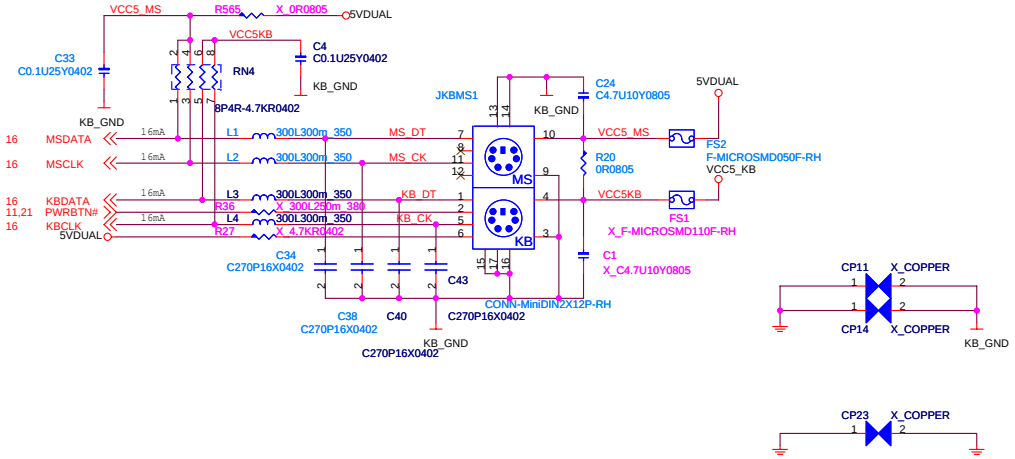
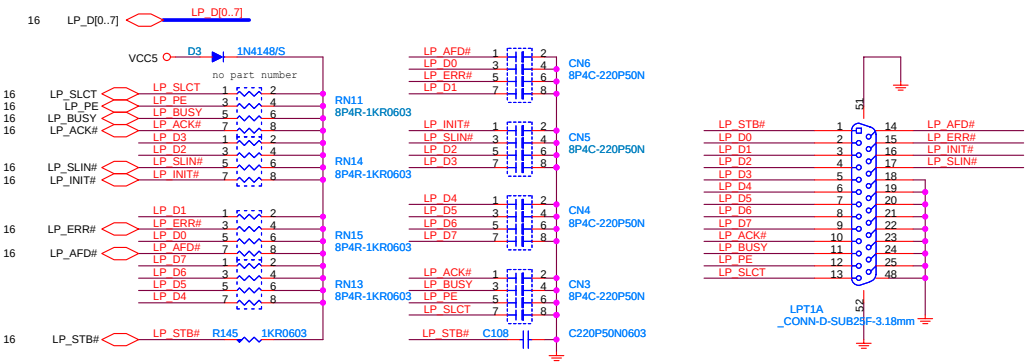


PS2 KEYBOARD & MOUSE CONNECTOR

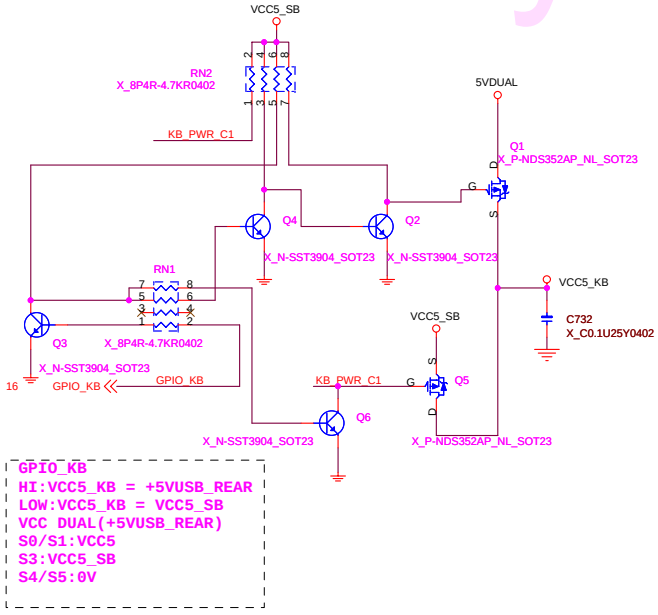


	FS2	R20	C24	L1	L2	C33	C33	C34	C38	FS1	C1	R27	R36
ROPROS-MA	V	V	V	V	V	V	V	V	V	X	X	X	X
ROPROS-VS	X	X	X	X	X	X	X	X	X	V	V	V	V
ROPROS-NECCA	V	V	V	V	V	V	V	V	V	X	X	X	X

PARALLAL PORT



K/B Power supply function for ROPROS-VS

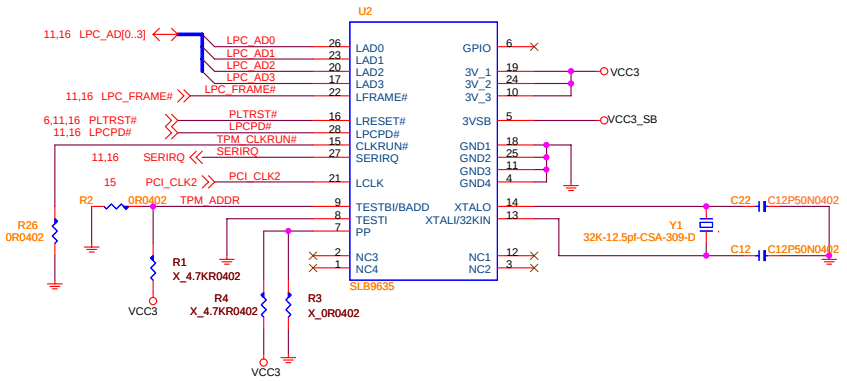



```
GPIO_KB
HI:VCC5_KB = +5VUSB_REAR
LOW:VCC5_KB = VCC5_SB
VCC DUAL(+5VUSB_REAR)
S0/S1:VCC5
S3:VCC5_SB
S4/S5:0V
```

T.P.M FOR ROPROS-MA

TPM 1.2

IO Address:0x02E



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	MS-7410	
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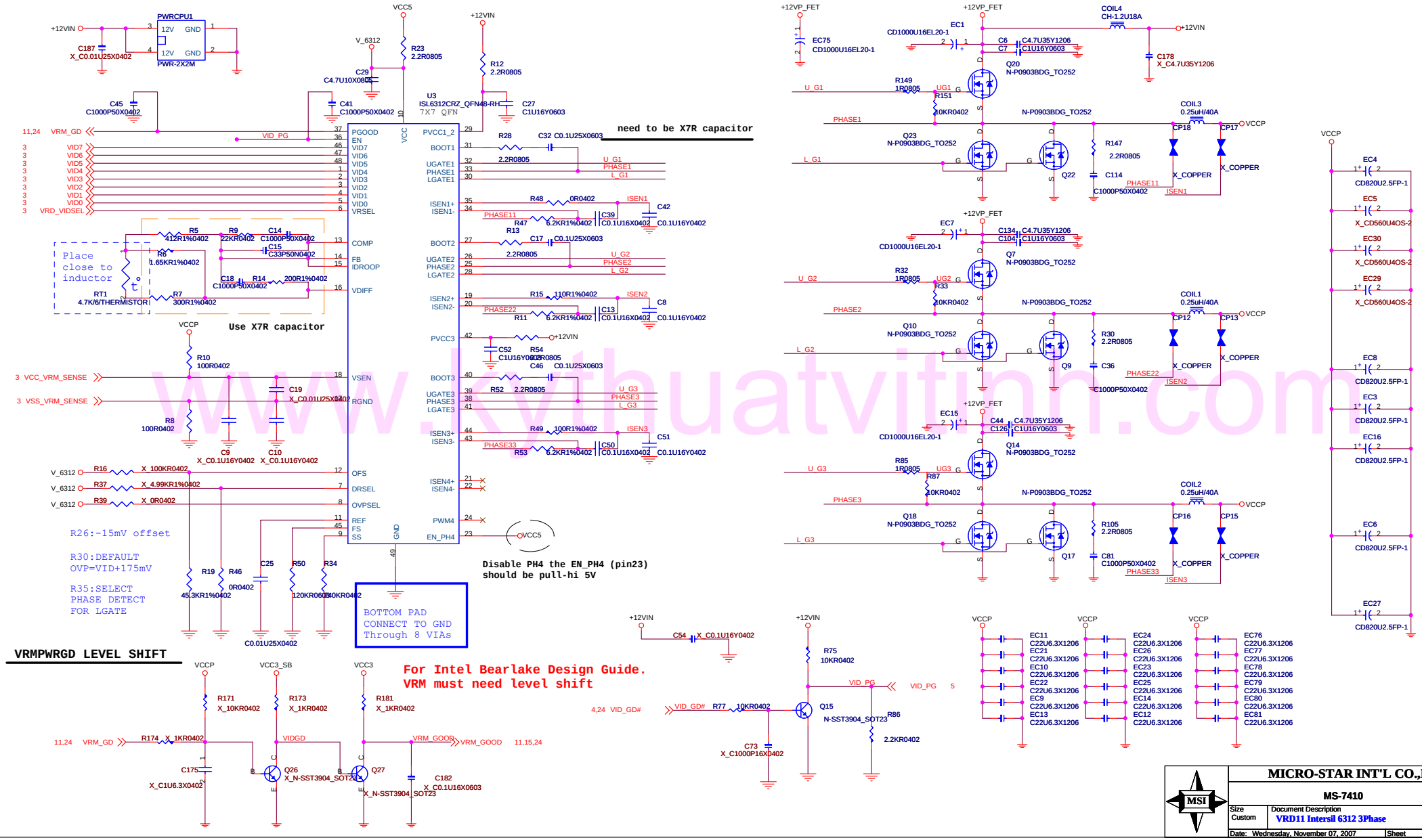
Voltage Regular Module

N-P0903BDG_TO252	mosfet/n-channel,P0903BDG,SMT/TO252,Rds(on)=9.5mΩ(10V/25A),Vgs(on) =1~3V,Id=50A,Ciss=1800pf,Qg=50nC,Vds=25V,Vgs=±20V,RoHS compliance
P75N02LDG/TO252	mosfet/n-channel,P75N02LDG,SMT/TO252,Rds(on)=7mΩ(@10V,30A),Vgs(on)=1~3V,Id=75A,Ciss=5000pf,Qg=140nC,Vds=25V,Vgs=±20V,RoHS compliance
C100U2SP	ESR<13mΩ,Ripple cur.<2.7A,LC<12uA,105C
CD560U4OS-2	CAP,OS-CON,560u/4V,Dip-2/8*9/3.5mm,ESR<7mohm, Ripplecur.=6100mA ,Lc. <500uA,SPEC series,RoHS compliance
1800UF/6.3V	ESR<12mΩ, Ripplecur<2350mA,105C, longlife change from 2000hrs to 3000hrs ,KZJ series
0.25uH/40A	,IND CHOKE,0.25uH,20%,DIP/8.5mm,40A,0.6mOhm,,,PEW,FERRITE,SQUARE,RoHS COMPLIANCE
CH-1.1U25A-LF	IND CHOKE,1.1uH,20%,DIP/9mm,25A,1.4mOhm,5.5T,0.9mmx3,PEW,IRON,,LEAD FREE
CD1000U16EL20-2	CAP,EL,1000u,16V,Dip-8x20/3.5mm,20%,12mOhm,2350mA,105C,3000hrs,RoHS COMPLIANCE



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Size: Custom	Document Description: VRD11 Intersil 6312 3Phase	Rev: 0C
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ACPI Controller MS-7

VDIMM LINEAR OR PWM SELECT

VDIMM MODE	EXTRAM
LINEAR REGULATOR	PULL LOW
PWM REGULATOR	PULL HIGH

3VSB MODE SELECT

3VSB MODE	3VDLDEC#
SINGLE MOSFET	PULL HIGH
DUAL MOSFET	PULL LOW

DDR AND DDR II VOLT SELECT

DDRTYPE	VDIMM
PULL LOW	2.5V
PULL HIGH	1.8V

V_FSB_VTT 6.2A

D03-06N030B-I14

THIS PIN IS OPEN DRAIN OUTPUT

Kinesfiled VTT SEL

VTT_SEL = L	V_FSB_VTT=1.1V	For future KENTSFIELD processor. (FSB1333, Quad-Core)
VTT_SEL = H	V_FSB_VTT=1.2V	For normal processors.

5V DUAL Power

VCC3_SB Power

DDR VTT Power

1.5V POWER

Reserved for V_1P5_CORE soft-start

Turn off V_1P5_ICH when enter S3.close to in ms7

V_1P05_ICH 2A

VCC_DDR (18 A)

Irms=18*0.48=8.64A
Icap (total) =5.7A*2=11.4A >8.64A
Iinput=18*0.36/0.9=7.2A,so need choose 1.2UH/8A choke

Vout=1.8V 12A

CLOSE TO DEVICE FB

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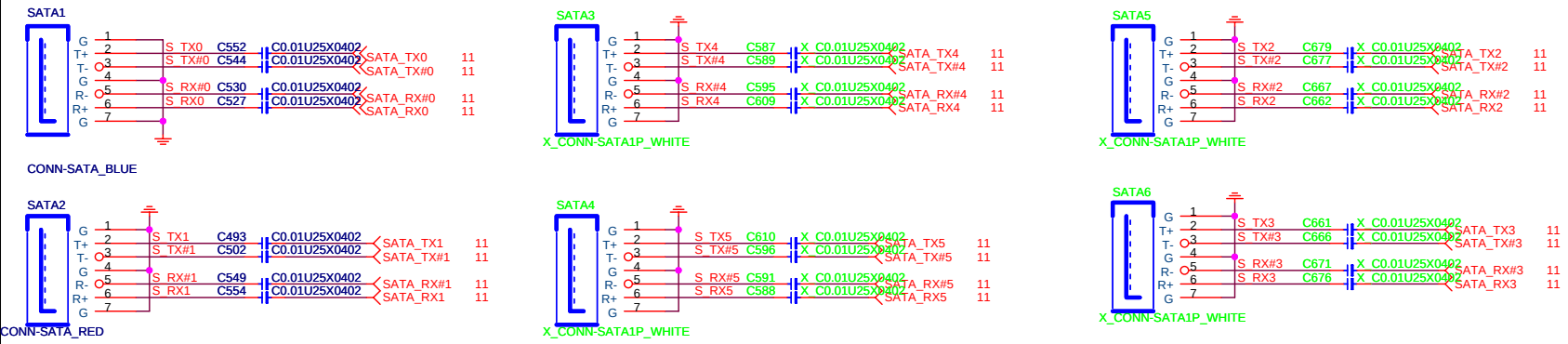
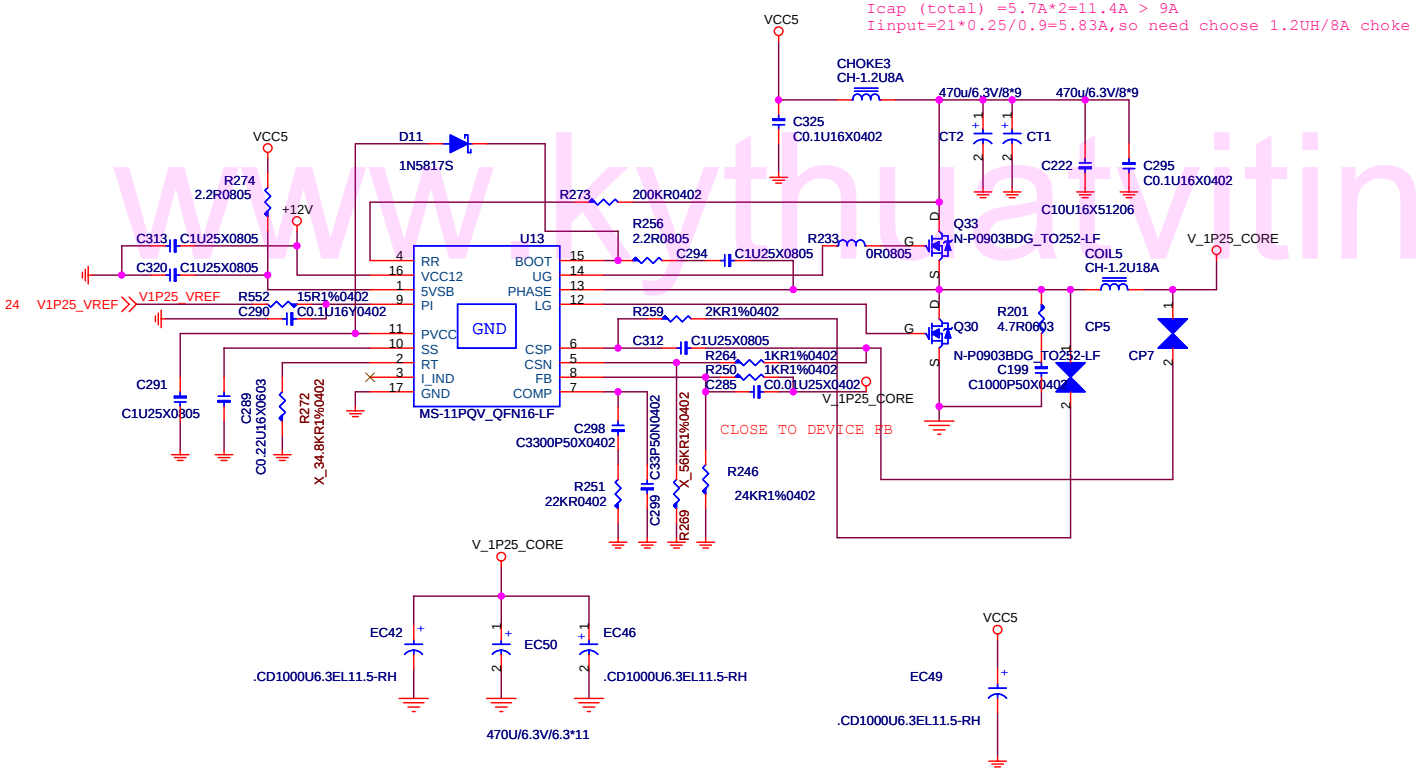
SERIAL ATA CONNECTOR BLOCK SATA1&SATA2 FOR ROPROS-MA/VS USE



GMCH 1.25V POWER (21.3A)

Irms=21*0.433=9.09A
Icap (total) =5.7A*2=11.4A > 9A
Iinput=21*0.25/0.9=5.83A,so need choose 1.2UH/8A choke



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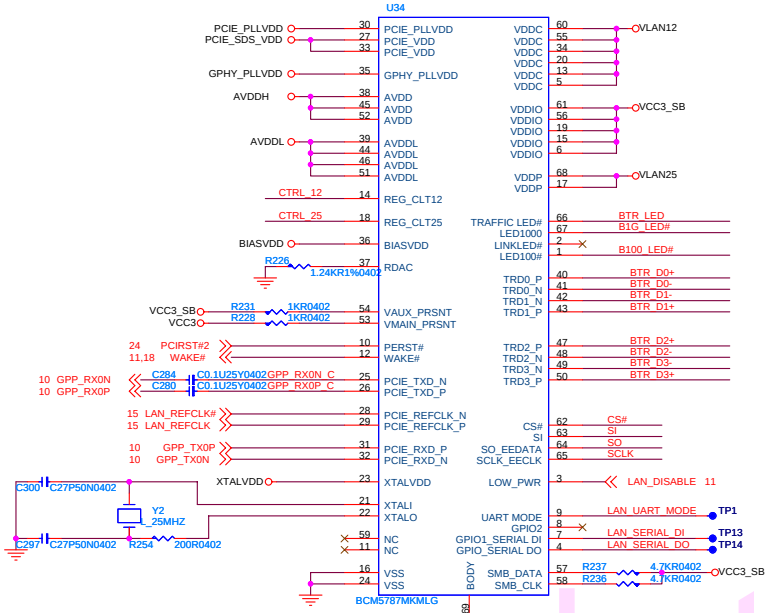
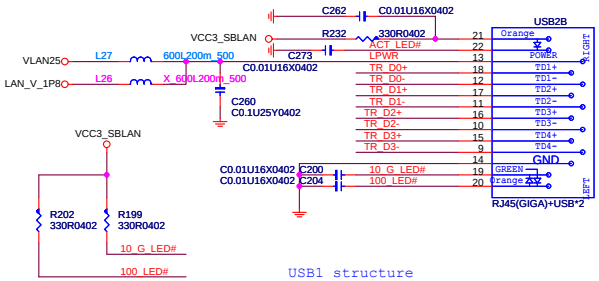
BCM5787M LAN CHIP (ROPROS-MA / NECCAP USE)



LAN Connector



Giga-Lan

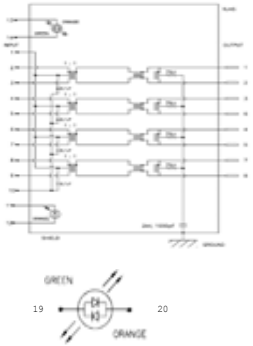
N58-22F0271-S42

Link	Yellow
Active	Blinking
1000	Orange
100	Green
10	None

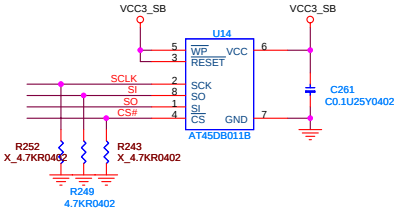
21 Yellow

20 Orange

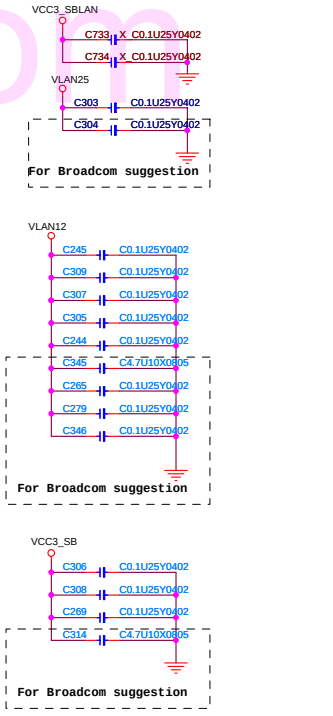
19 Green



LAN EEPROM

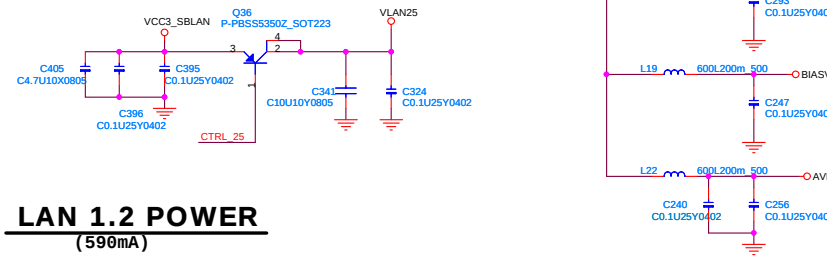


Bypass CAPs



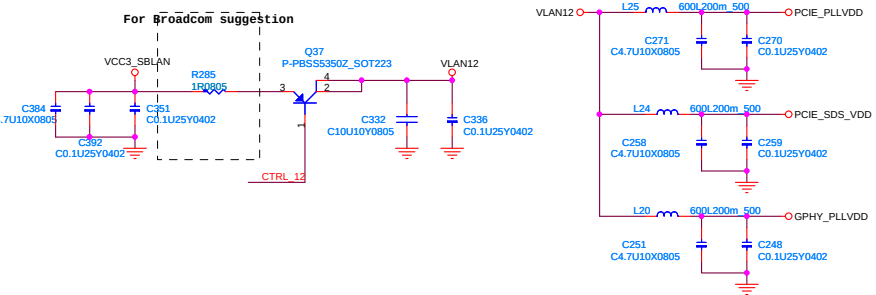
LAN 2.5 POWER

(235mA)

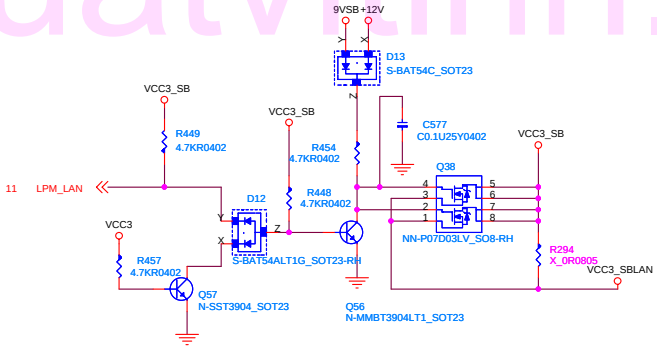


LAN 1.2 POWER

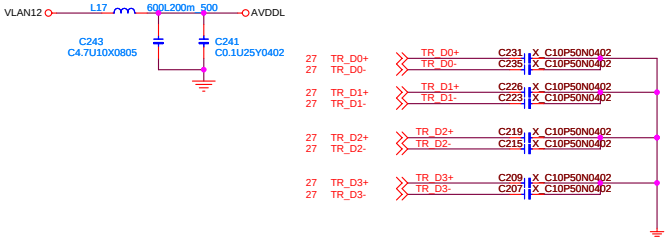
(590mA)



Power control for power consumption



EMI SUGGESTION



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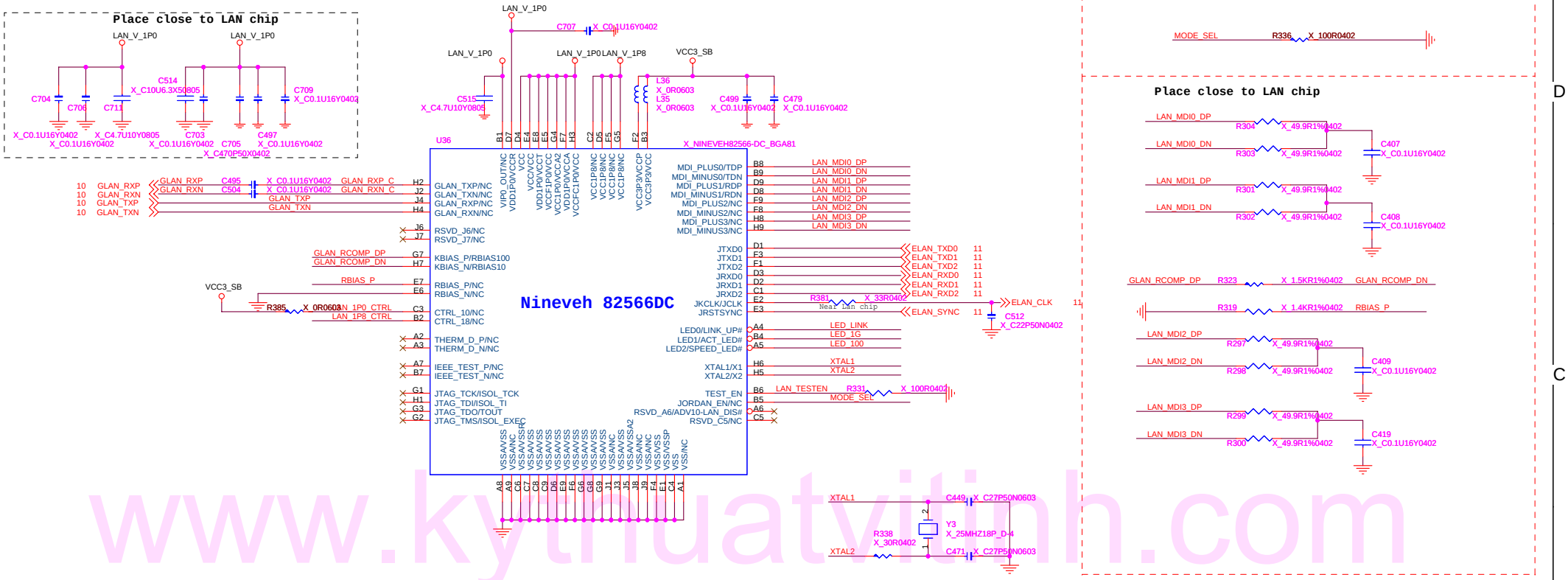
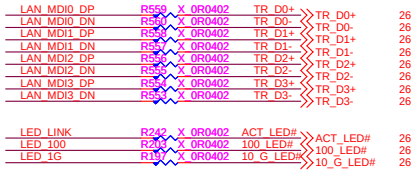
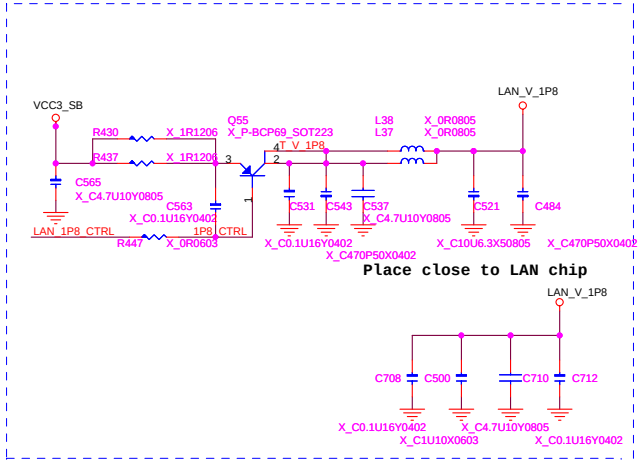
LAN - NINEVEH (ROPROS-VS USE)







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

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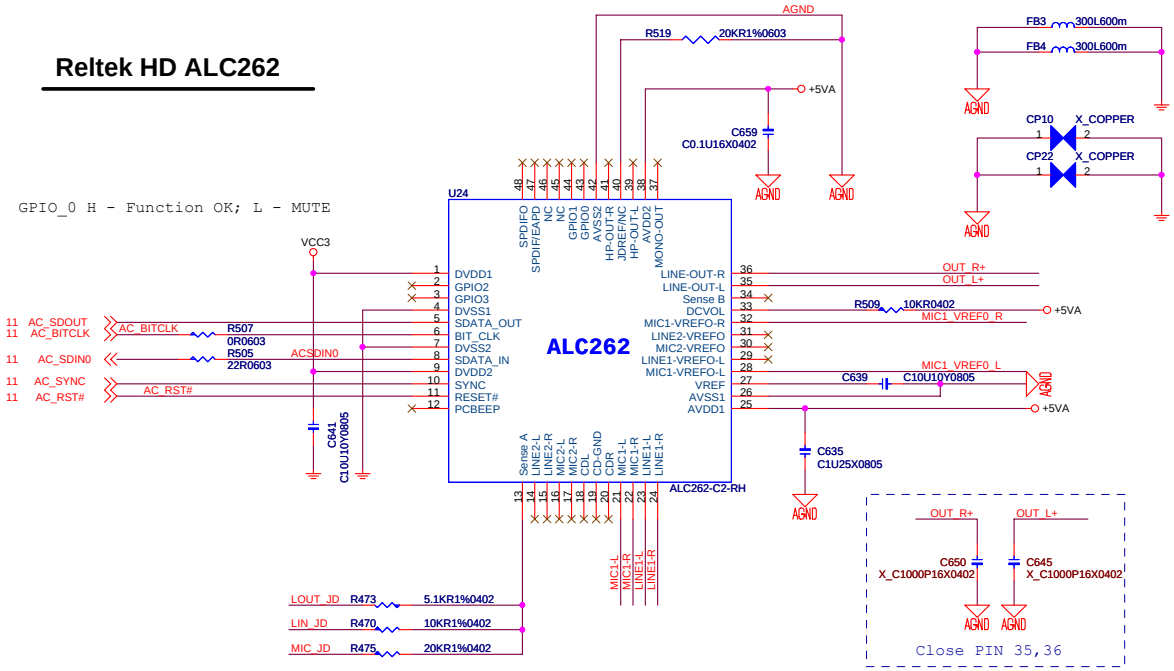
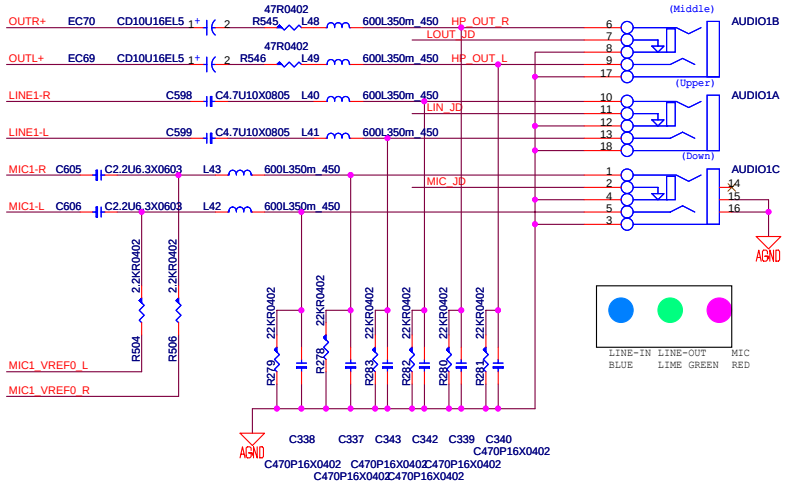
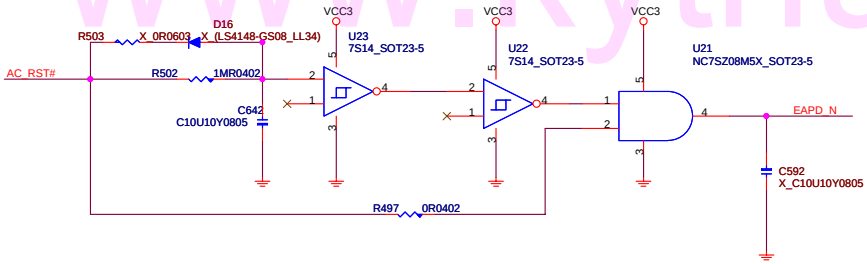
Reltek HD ALC262



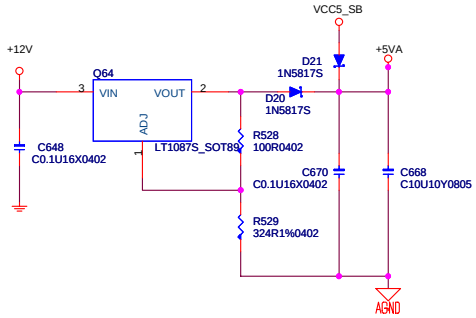


08/01 UPDATE

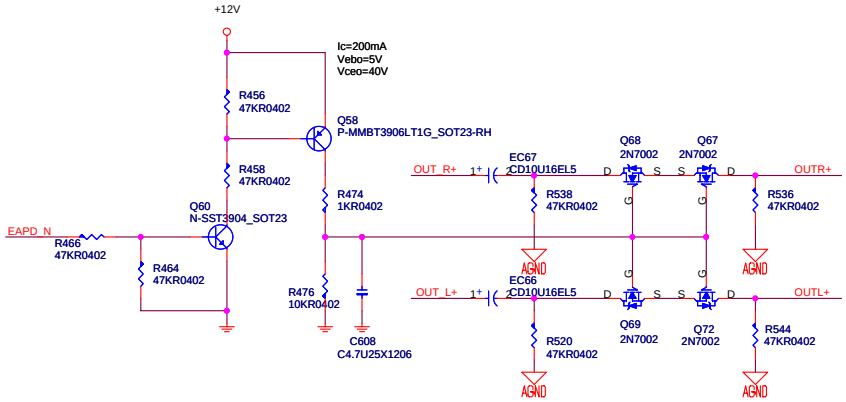
POP noise circuit



AUDIO CODE REGULATORS



Smooth pop noise circuit for Line-out



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ICH9

GPIO	Alt Func	Pin	I/O/NC	Power	PU	Tol	Default	Signal Name or condition
GPIO[0]	ATADET0	N7	I/O	Vcc3	Y	3.3	INPUT	ATADET0 PULL HIGH 10K
GPIO[1]	PULL HIGH	AK21	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 10K
GPIO[2]	PIRQ#E	K6	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 8.2K
GPIO[3]	PIRQ#F	L7	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 8.2K
GPIO[4]	PIRQ#G	F2	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 8.2K
GPIO[5]	PIRQ#H	G2	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 8.2K
GPIO[6]	PULL HIGH	AH22	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 10K
GPIO[7]	PULL HIGH	AK23	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 10K
GPIO[8]	ICH GP8 PU	A20	I/O	Vcc3SB	Y	3.3	INPUT	PULL HIGH 10K
GPIO[9]	SIO SMI#	A18	NC	Vcc3	N	3.3	WOL EN	NC
GPIO[10]	ICH GP10 PU	C17	I/O	Vcc3SB	Y	3.3	INPUT	PULL HIGH 10K
GPIO[11]	SMB ALERT#	C16	I/O	Vcc3SB	Y	3.3	SMB ALERT#	PULL HIGH 10K
GPIO[12]	NC	A8	NC	Vcc3SB	N	3.3	OUTPUT	SIO SMI#
GPIO[13]	SIO PME#	A19	I/O	Vcc3SB	Y	3.3	INPUT	SIO PME#
GPIO[14]	CLR PW	A9	I/O	Vcc3SB	Y	3.3	INPUT	PULL HIGH 10K
GPIO[15]	NC	C15	NC	Vcc3SB	Y	3.3	STP PCI#	NC
GPIO[16]	NC	M2	NC	Vcc3	Y	3.3	OUTPUT	NC
GPIO[17]	PULL HIGH	AH21	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 10K
GPIO[18]	NC	K1	NC	Vcc3	N	3.3	OUTPUT	NC
GPIO[19]	SATA1GP PU	AE20	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 10K
GPIO[20]	NC	AF5	NC	Vcc3	N	3.3	OUTPUT	NC
GPIO[21]	SATA0GP PU	AK25	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 10K
GPIO[22]	ICH SGP22 PU	AJ24	I/O	Vcc3	Y	3.3	INPUT	PULL HIGH 10K
GPIO[23]	LDRQ 1#	J3	I/O	Vcc3	Y	3.3	LDRQ 1#	PULL HIGH 10K
GPIO[24]	LPM LAN	A14	NC	Vcc3SB	N	3.3	OUTPUT	LPM LAN
GPIO[25]	NC	B18	NC	Vcc3SB	N	3.3	STP CPU#	NC
GPIO[26]	NC	C11	NC	Vcc3SB	N	3.3	S4 STATE#	NC
GPIO[27]	NC	A11	NC	Vcc3SB	N	3.3	QRT STATE0	NC
GPIO[28]	NC	G18	NC	Vcc3SB	N	3.3	QRT STATE1	NC
GPIO[29]	USB OC#2	N1	I/O	Vcc3SB	Y	3.3	OC#2	USB OC#2
GPIO[30]	USB OC#3	N5	I/O	Vcc3SB	Y	3.3	OC#3	USB OC#3
GPIO[31]	USB OC#3	M1	I/O	Vcc3SB	Y	3.3	OC#3	USB OC#3
GPIO[32]	SPI WP#	K2	I/O	Vcc3	N	3.3	OUTPUT	SPI WP#
GPIO[33]	SPI HOLD GPO#	AF6	I/O	Vcc3	N	3.3	OUTPUT	SPI HOLD GPO#
GPIO[34]	LAN DISABLE	AH5	I/O	Vcc3	N	3.3	OUTPUT	LAN DISABLE
GPIO[35]	NC	L1	NC	Vcc3	N	3.3	OUTPUT	NC
GPIO[36]	SATA2GP PU	AE21	I/O	Vcc3	Y	3.3	INPUT	SATA2GP PU
GPIO[37]	SATA3GP PU	AE22	I/O	Vcc3	Y	3.3	INPUT	SATA3GP PU
GPIO[38]	ICH SGP38 PU	AK24	I/O	Vcc3	Y	3.3	INPUT	ICH SGP38 PU
GPIO[39]	ICH SGP39 PD	AH23	I/O	Vcc3	Y	3.3	SDATAOUT0	ICH SGP39 PD
GPIO[40]	USB OC#0	N3	I/O	Vcc3SB	Y	3.3	OC#0	USB OC#0
GPIO[41]	USB OC#1	P7	I/O	Vcc3SB	Y	3.3	OC#1	USB OC#1
GPIO[42]	USB OC#1	R7	I/O	Vcc3SB	Y	3.3	OC#1	USB OC#1
GPIO[43]	USB OC#2	N2	I/O	Vcc3SB	Y	3.3	OC#2	USB OC#2
GPIO[44]	USB OC#3	P3	I/O	Vcc3SB	Y	3.3	OC#3	USB OC#3
GPIO[45]	USB OC#3	R6	I/O	Vcc3SB	Y	3.3	OC#3	USB OC#3
GPIO[46]	USB OC#3	T7	I/O	Vcc3SB	Y	3.3	OC#3	USB OC#3
GPIO[47]	USB OC#3	P1	I/O	Vcc3SB	Y	3.3	OC#3	USB OC#3
GPIO[48]	ICH SGP48 PD	AD20	I/O	Vcc3	Y	3.3	SDATAOUT1	PULL HIGH 10K
GPIO[49]	DMI STRAP	AJ25	I/O	Vcc3	N	3.3	OUTPUT	PULL LOW 2.2K
GPIO[50]	PREQ#1	G13	I/O	Vcc5	Y	5.5	PREQ#1	PULL HIGH 2.7K
GPIO[51]	PGNT#1	A7	I/O	Vcc3	N	3.3	PGNT#1	PGNT#1
GPIO[52]	PREQ#2	F13	I/O	Vcc5	Y	5.5	PREQ#2	PULL HIGH 2.7K
GPIO[53]	PGNT#2	C7	I/O	Vcc3	N	3.3	PGNT#2	STRAP PIN
GPIO[54]	PREQ#3	G8	I/O	Vcc5	Y	5.5	PREQ#3	PULL HIGH 2.7K
GPIO[55]	PGNT#3	F7	I/O	Vcc3	N	3.3	PGNT#3	STRAP PIN
GPIO[56]	ICH GP56 PU	F16	I/O	Vcc3SB	Y	3.3	GPIO SEL	PULL HIGH 10K
GPIO[57]	ICH GP57 PU	C12	I/O	Vcc3SB	Y	3.3	INPUT	PULL HIGH 10K
GPIO[58]	SPI CS1#	F23	I/O	Vcc3SB	Y	3.3	SPI CS1#	SPI CS1#
GPIO[59]	USB OC#0	P5	I/O	Vcc3SB	Y	3.3	OC#0	USB OC#0
GPIO[60]	LINK ALERT#	F18	I/O	Vcc3SB	Y	3.3	LINK ALERT#	LINK ALERT#

SIO SCH5617

PIN NAME	PIN#	USAGE	Input/Output
GP76	53	GPIO_KB	OUTPUT
GP42	27	SIO_SMI#	OUTPUT
GP41	77	SIO_PME#	OUTPUT

PCI Config.

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK
PCI1	PIRQ#A PIRQ#B PIRQ#C PIRQ#D	PREQ#0 PGNT#0	AD16	PCI_CLK0
PCI2	PIRQ#B PIRQ#D PIRQ#C PIRQ#A	PREQ#1 PGNT#1	AD17	PCI_CLK1

DDRII DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	A0H	MCLK_A0/MCLK_A#0 MCLK_A1/MCLK_A#1 MCLK_A2/MCLK_A#2
DIMM 2	A2H	MCLK_A1/MCLK_A#3 MCLK_A2/MCLK_A#4 MCLK_A2/MCLK_A#5
DIMM 3	A4H	MCLK_B0/MCLK_B#0 MCLK_B2/MCLK_B#1 MCLK_B1/MCLK_B#2
DIMM 4	A6H	MCLK_B0/MCLK_B#3 MCLK_B1/MCLK_B#4 MCLK_B2/MCLK_B#5

JUMPER SETTING

JBAT1	(1-2)NORMAL	(2-3)CLEAR

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MS-7410

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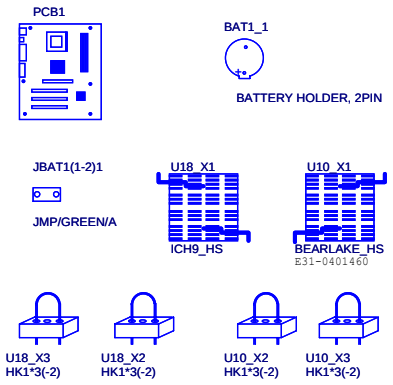
MANUAL PART



CPU Retention Module

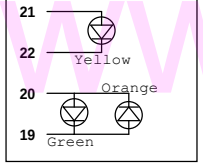
PROCESSOR1_1

CPU Retention w/screw w/washer

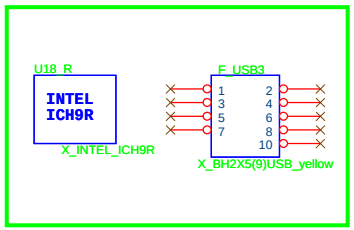
VS Giga-Lan

N58-22F0391-S42

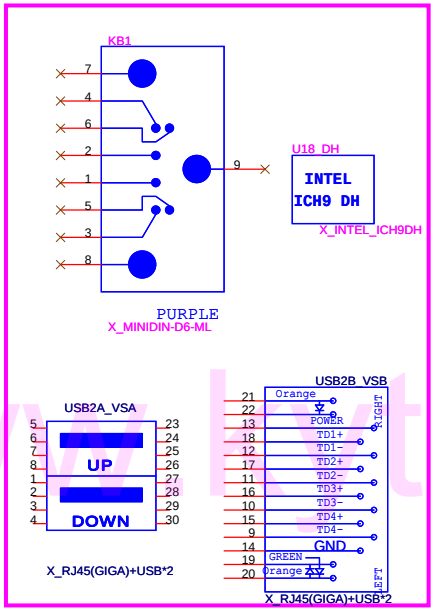
Link	Yellow
Active	Blinking
1000	Orange
100	Green
10	None



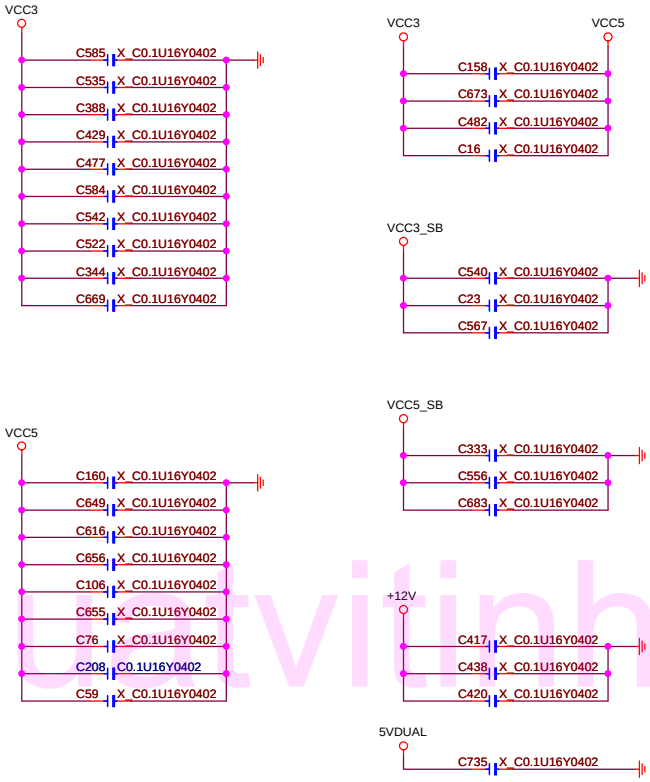
REPROS-NECCAP



REPROS-VS



EMI SUGGESTION



Model option table

Model type	Function	BOM Config	ERP BOM No.
MS7410-MA	INTEL G33 + ICH9 + Broadcom Giga Lan		
MS7410-VS	INTEL G33 + ICH9DH + Intel 82566 Giga Lan		
MS7410-NECCAP	INTEL G33 + ICH9R + Broadcom Giga Lan		

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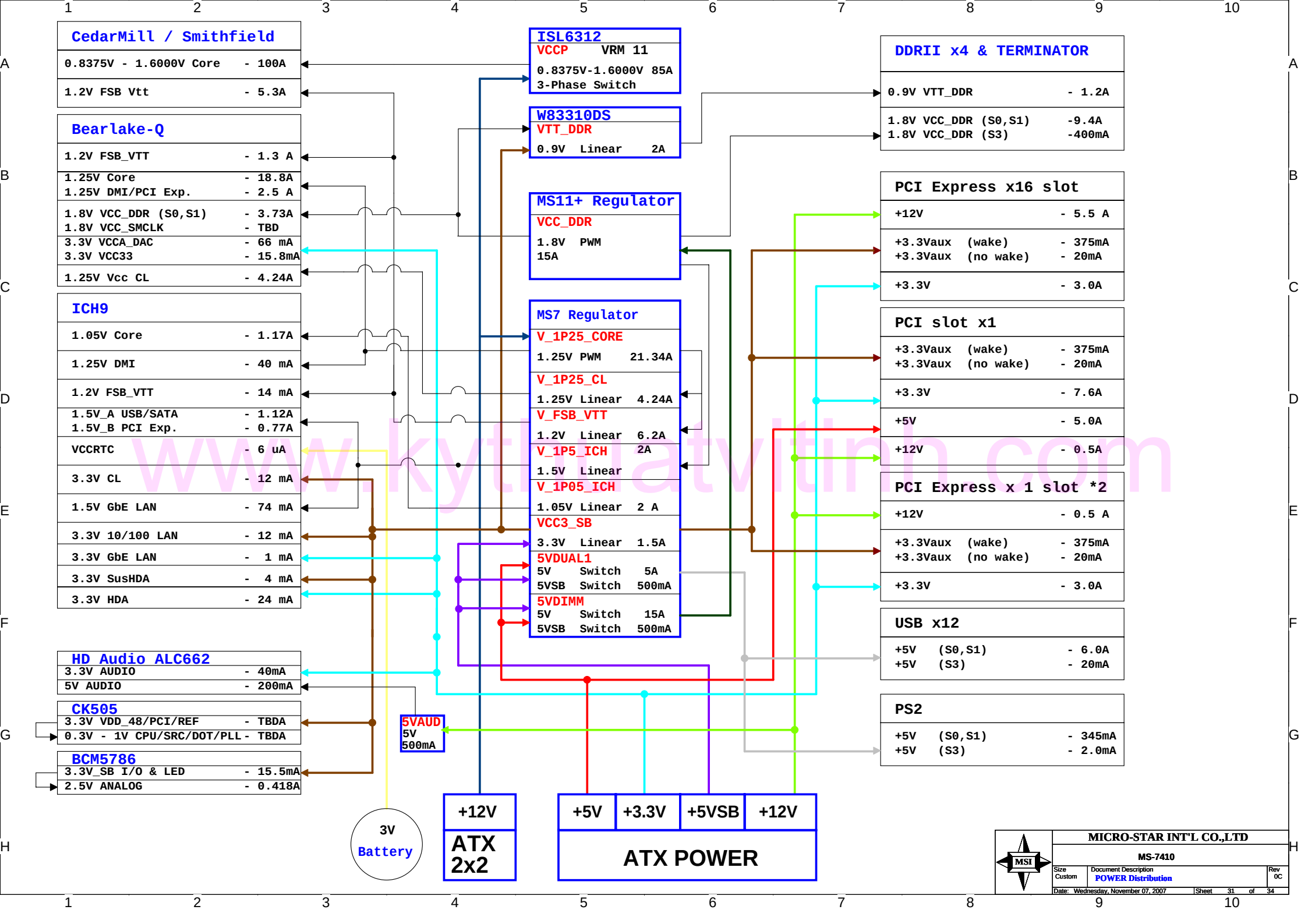
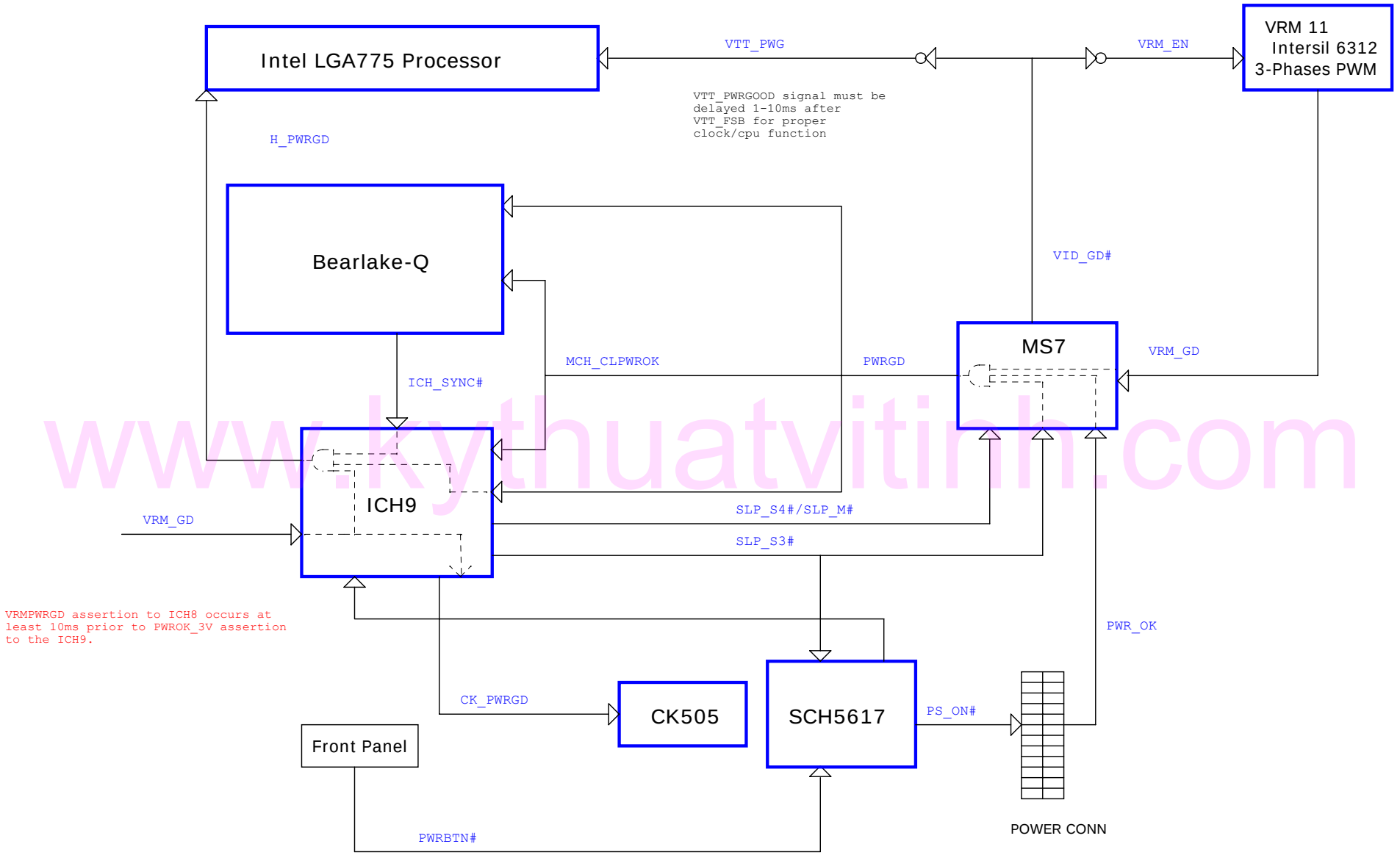


PWROK MAP



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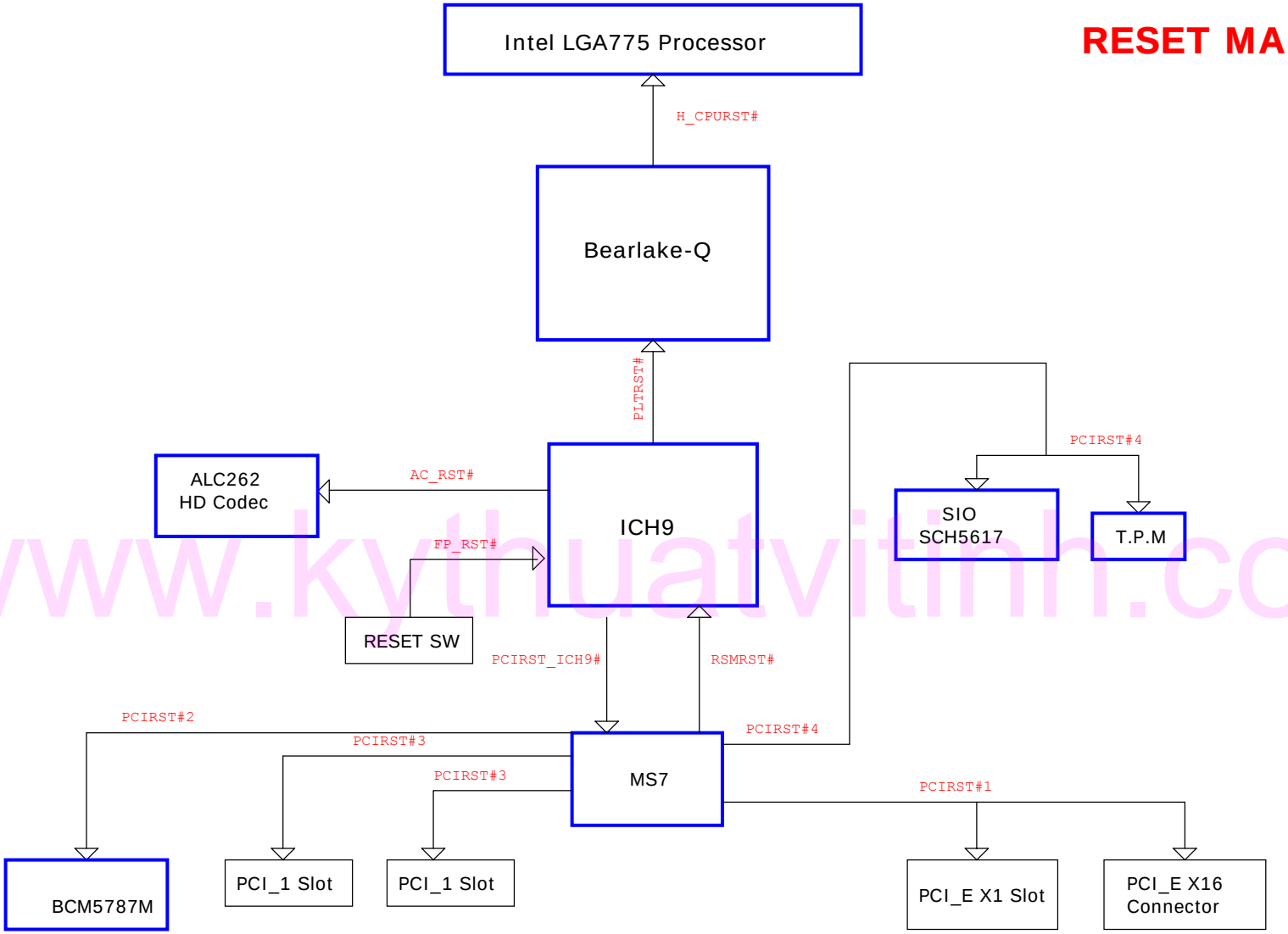
RESET MAP



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MS-7410		
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Change Note

Ver:0A

2007/09/06

1.PAGE 4:Add R561 C721 Q73 for VTT SEL control circuit

2.PAGE 11:change the net name of SATA2.3&SATA4.5 to avoid confuse

3.PAGE 11: add R564 pull-down resister to LAN_PWROK ,when not use intel lan ,the LAN_PWROK need tied to gnd

4.PAGE 12: To change the net of VccCL3_3&VccLAN3_3 power source form VCC3 to VCC3_SB for INTEL LAN W/O F/T

5.PAGE 20:Front_USB1&Front_USB2 PIN5 tied to gnd for MCR Device use

6.PAGE 22:change VCC5_MS power rail to 5VDUAL to avoid MS have voltage when enter S5 state

7.PAGE 24:change VTT_SEL control circuit to follow up 7400 design

8.PAGE10& PAGE20:change USB PORT from6&7 port to 10&11 port

9.PAGE23:remove EC18 ,add EC76~EC81 for CPU power quility

Ver:0B

2007/11/05

1.PAGE 17:Change PWR&SYS resister vaule for FAN linear control circuit

2.PAGE 18:Change +12V EL CAP from 1000uf/6.3v to 470uf/16v

3.PAGE 21:Change D-SUB RGB Filter vaule for EMI

4.PAGE 24:Change PWR&SUS LED power resource from VCC5_SB to 5VDUAL1

5.PAGE 11:Reserve D22 for BEEP Noise

6.PAGE 11:Modify R387&C503 value of Exrernal RTC Circuit

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