

MS-7440

Version 0A

CPU:

Intel Dimondville

System Chipset:

Intel 945GSE (North Bridge)

Intel ICH7M(South Bridge)

On Board Chipset:

Clock Generator - ICS9LPRS113

HD AUDIO CODEC(ALC888)

Giga LAN -- Realtek RTL8111C

LVDS CHRONTEL - CH7308B(option)

SIO-Fintek F71882F

Card Reader RTS5158E

AMP - (TBD)

BIOS -- SPI

Main Memory:

DDR II SO-DIMM x 1 (Max 1GB)

Expansion Slots:

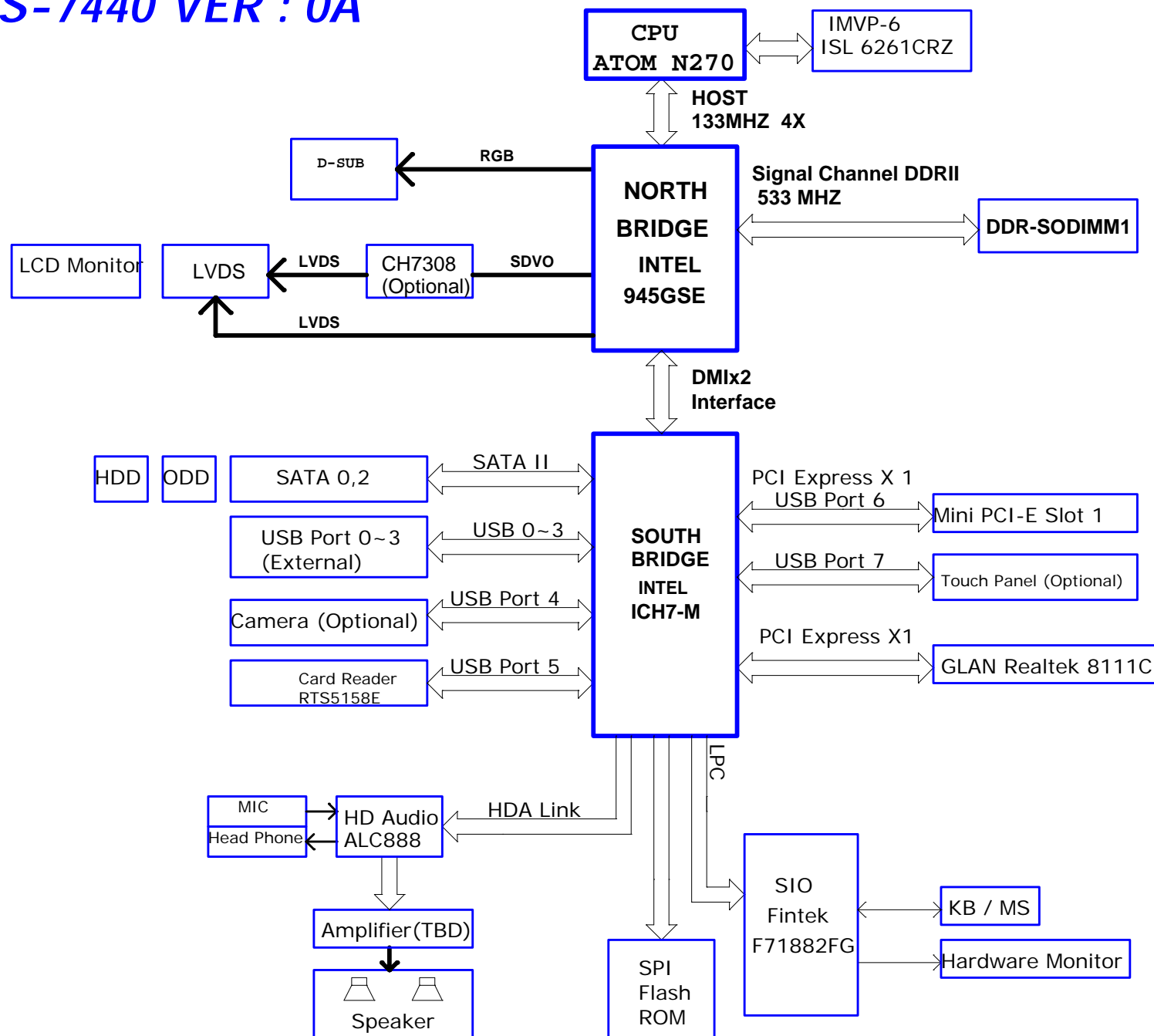
Internal Mini PCIE x1

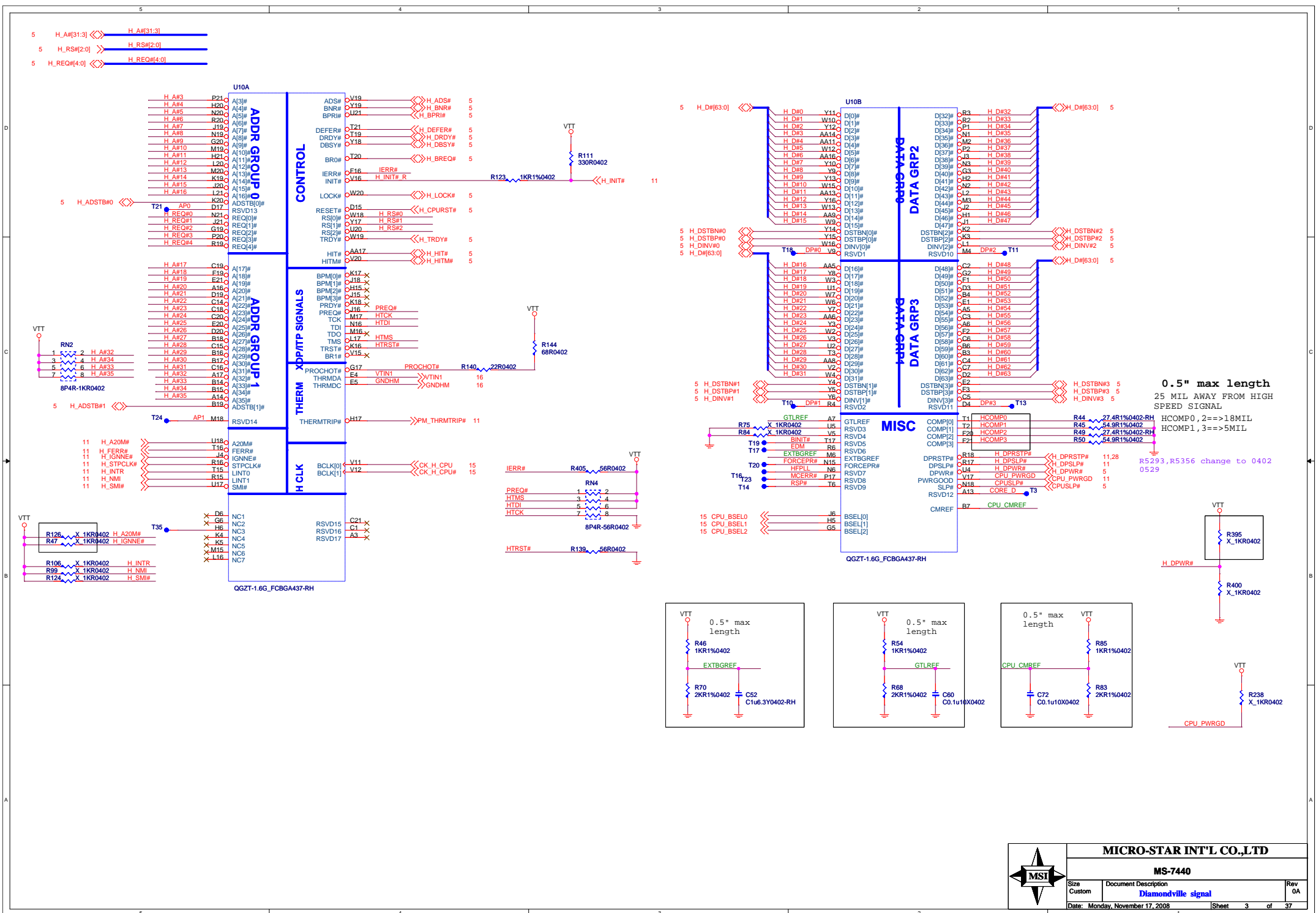
Intersil PWM:

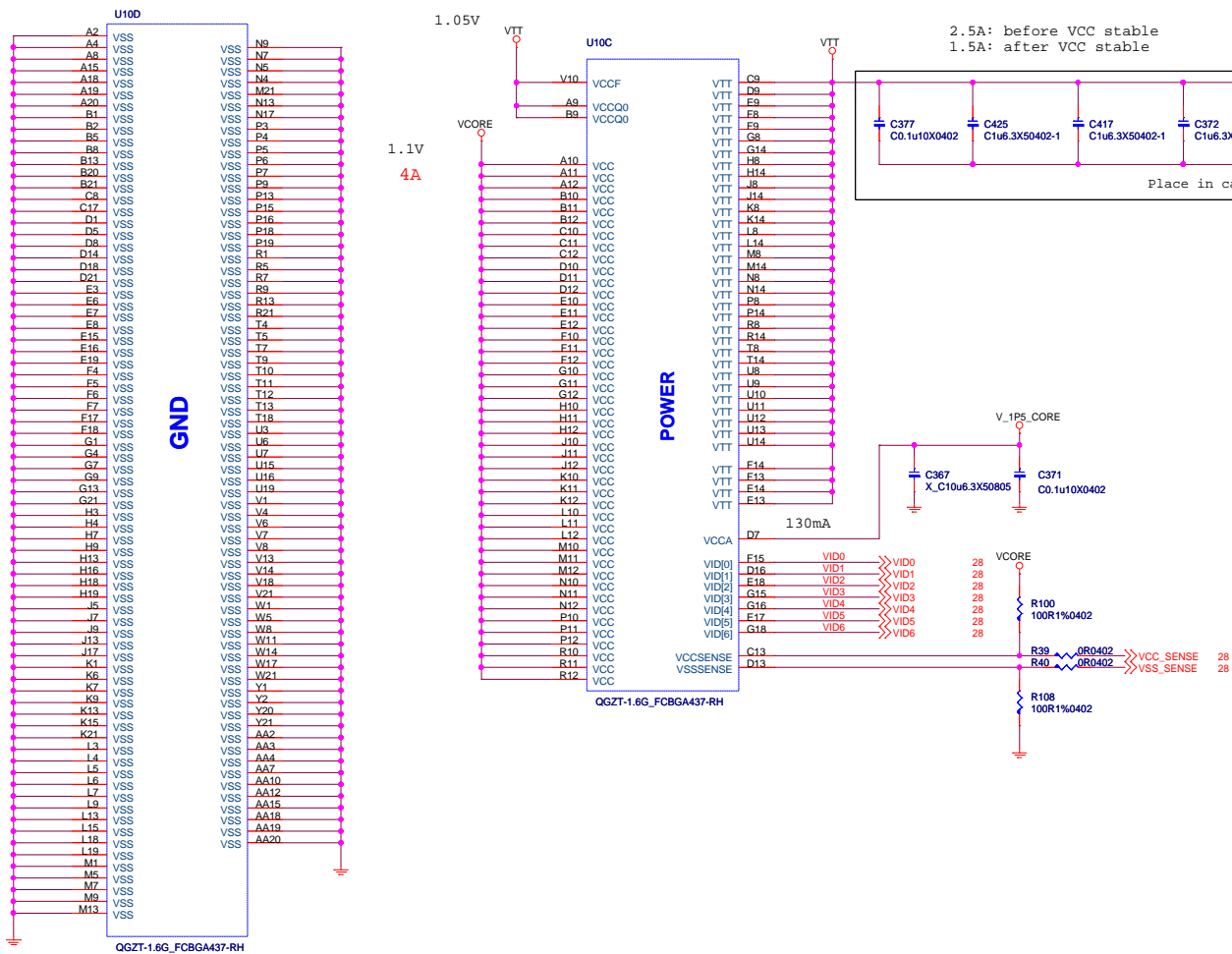
Controller: ISL6261CRZ-T

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BLOCK DIAGRAM	2
Diamondville	3-4
Intel 945GSE	5-8
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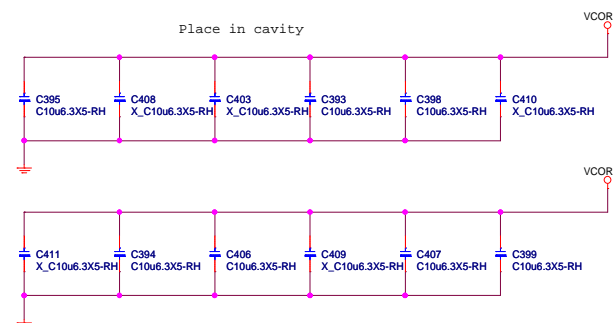
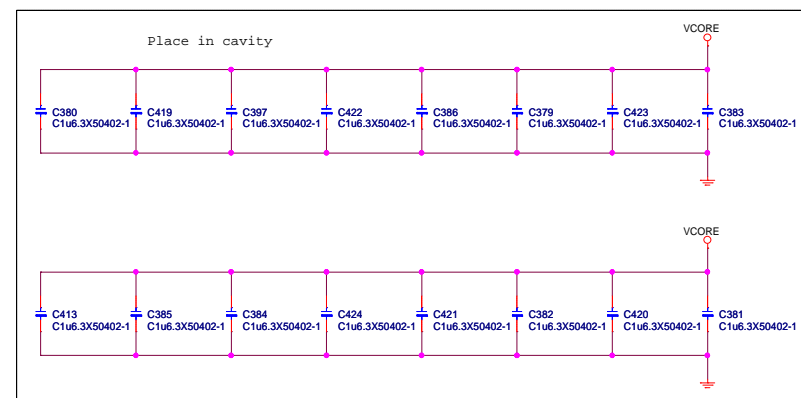
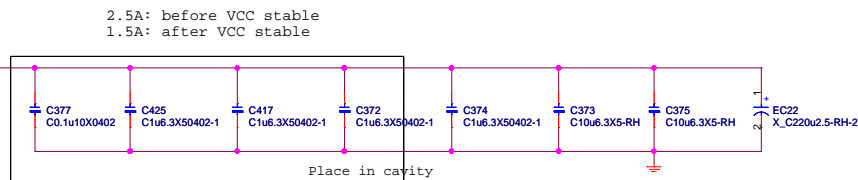
MS-7440 VER : 0A







LAYOUT NOTE:
Route VCCSENSE and VSSSENSE
traces at 27.4Ohms with 50
mil spacing.
Place PU and PD within 1
inch of CPU.

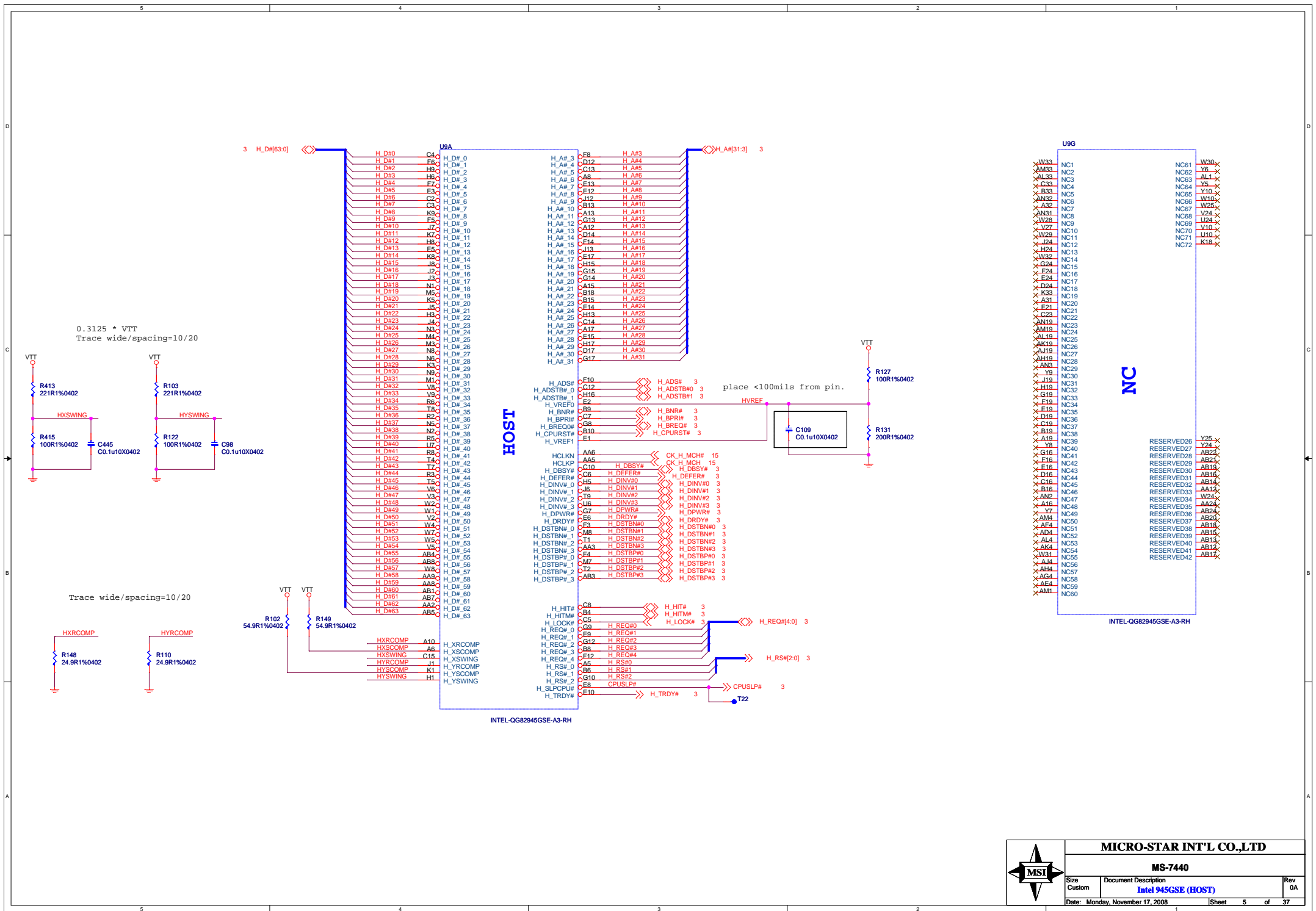


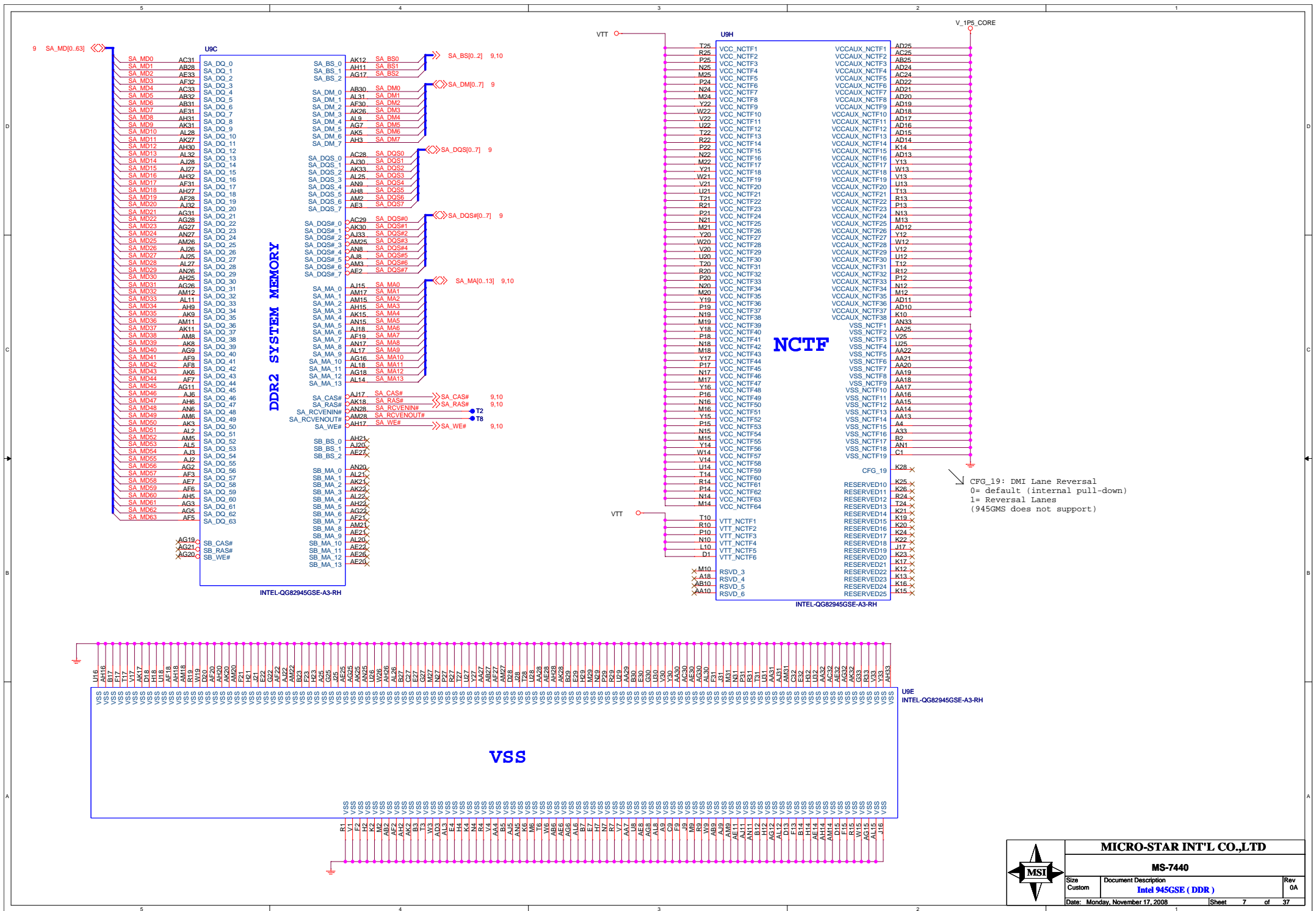
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MS-7440

Size Custom	Document Description Diamondville Power/GND
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945 GSE Power

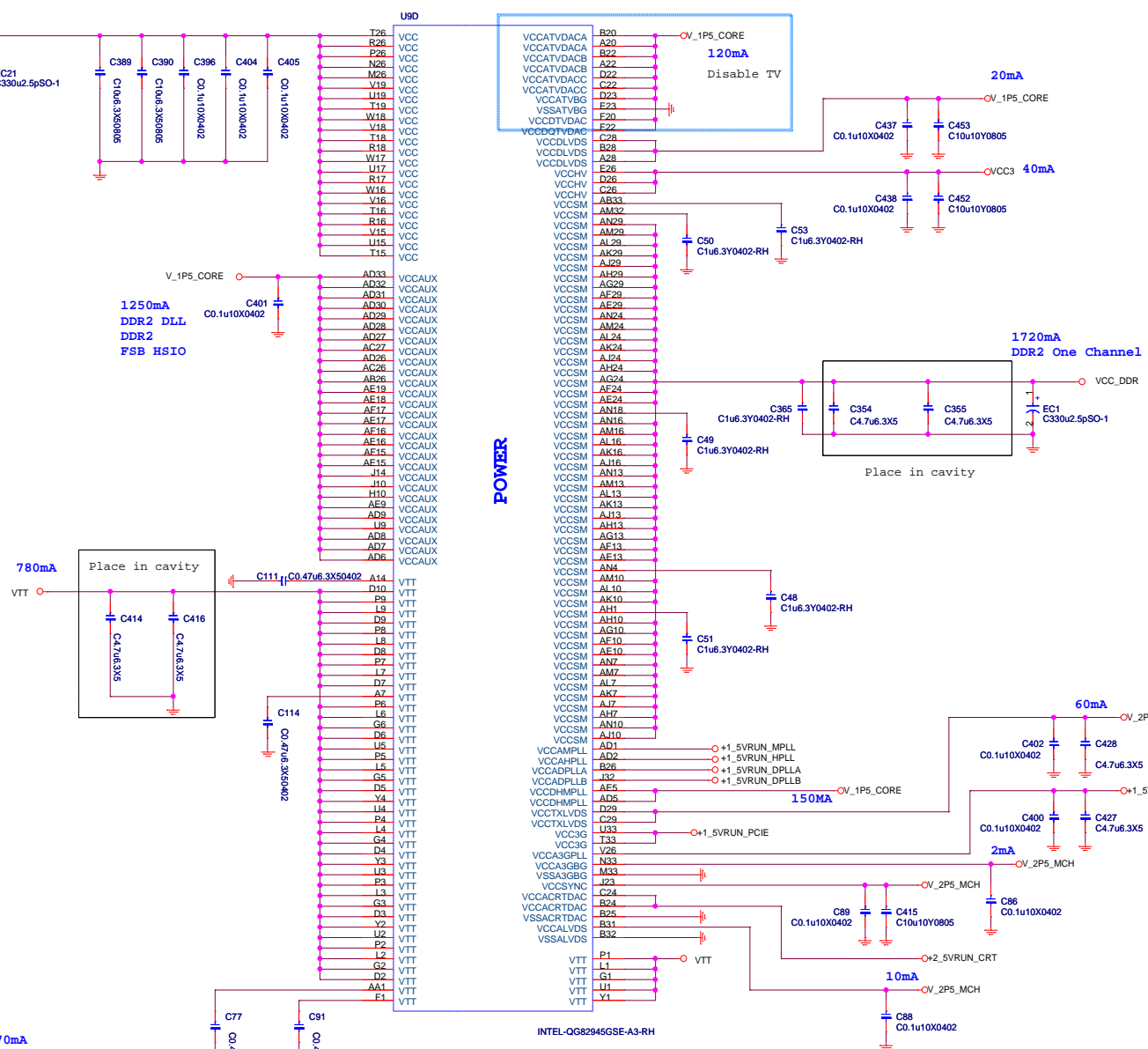
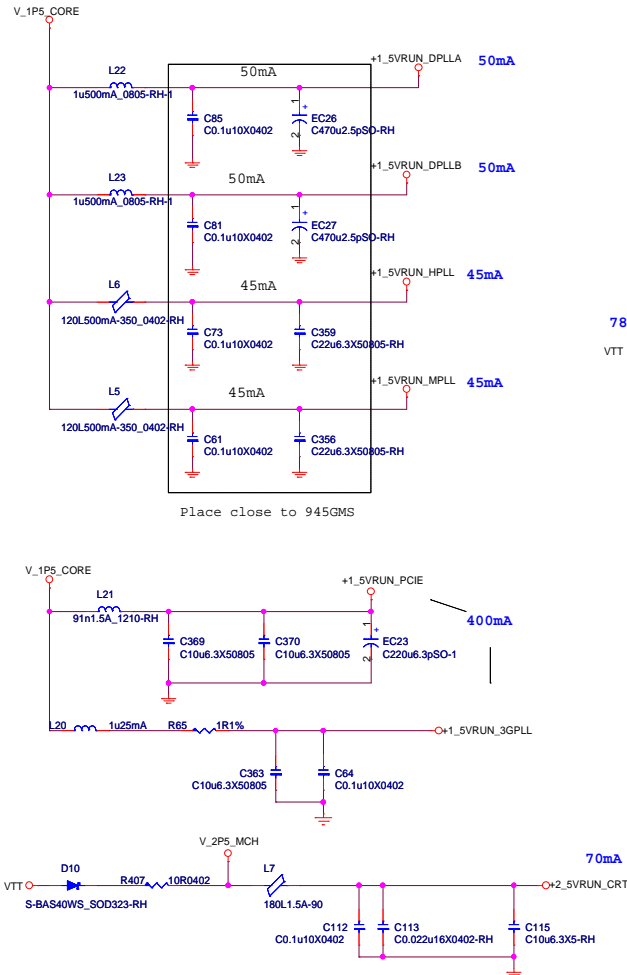
VTT=> 3.72A OK

V_1P5_CORE=> 2.13A OK

VCC_DDR=> 1.72A OK

V_2P5_MCH=>142mA OK

VCC3=> 40mA OK



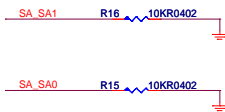
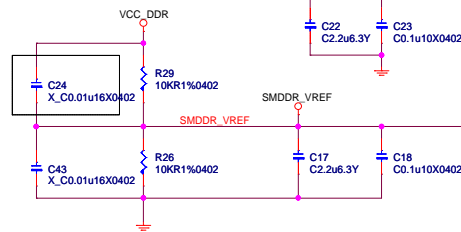
to disable lvds,
connect VCCTCLVDAS and VCCALVDS to GND
modify 2008.05.20

DIMM1A	
SA MD0	5
SA MD1	7
SA MD2	17
SA MD3	19
SA MD4	4
SA MD5	6
SA MD6	14
SA MD7	16
SA MD8	23
SA MD9	35
SA MD10	35
SA MD11	37
SA MD12	20
SA MD13	22
SA MD14	36
SA MD15	38
SA MD16	43
SA MD17	45
SA MD18	45
SA MD19	57
SA MD20	44
SA MD21	46
SA MD22	56
SA MD23	58
SA MD24	61
SA MD25	63
SA MD26	73
SA MD27	75
SA MD28	62
SA MD29	64
SA MD30	74
SA MD31	76
SA MD32	123
SA MD33	125
SA MD34	135
SA MD35	137
SA MD36	124
SA MD37	126
SA MD38	134
SA MD39	136
SA MD40	141
SA MD41	143
SA MD42	151
SA MD43	153
SA MD44	140
SA MD45	142
SA MD46	152
SA MD47	154
SA MD48	157
SA MD49	159
SA MD50	173
SA MD51	175
SA MD52	158
SA MD53	160
SA MD54	174
SA MD55	176
SA MD56	179
SA MD57	181
SA MD58	189
SA MD59	191
SA MD60	180
SA MD61	182
SA MD62	192
SA MD63	194
DIMM200PS_BLACK-RH-1	
SA MD0	102
SA MD1	101
SA MD2	100
SA MD3	99
SA MD4	98
SA MD5	97
SA MD6	94
SA MD7	92
SA MD8	93
SA MD9	91
SA MD10	105
SA MD11	90
SA MD12	89
SA MD13	116
SA MD14	86
SA MD15	84
SA MD16	85
SA MD17	107
SA MD18	106
SA MD19	110
SA MD20	115
SA MD21	30
SA MD22	32
SA MD23	164
SA MD24	166
SA MD25	79
SA MD26	80
SA MD27	113
SA MD28	108
SA MD29	109
SA MD30	198
SA MD31	200
SA MD32	197
SA MD33	195
SA MD34	114
SA MD35	119
SA MD36	10
SA MD37	26
SA MD38	52
SA MD39	67
SA MD40	130
SA MD41	147
SA MD42	170
SA MD43	165
SA MD44	13
SA MD45	31
SA MD46	51
SA MD47	70
SA MD48	131
SA MD49	148
SA MD50	169
SA MD51	188
SA MD52	11
SA MD53	29
SA MD54	49
SA MD55	68
SA MD56	129
SA MD57	146
SA MD58	167
SA MD59	186

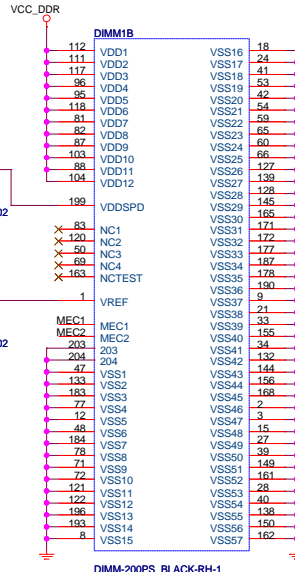
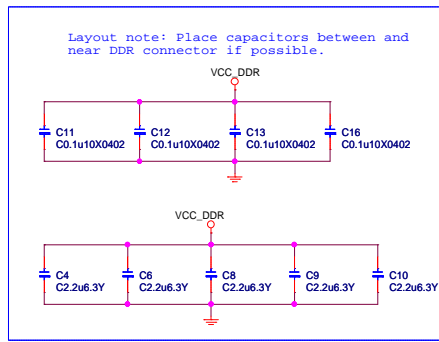
N13-2000220-A10
Bottom

SMBCLK_DDR R27 22R0402 SMBCLK_ISO 13.15.24
SMBDATA_DDR R28 22R0402 SMBDATA_ISO 13.15.24

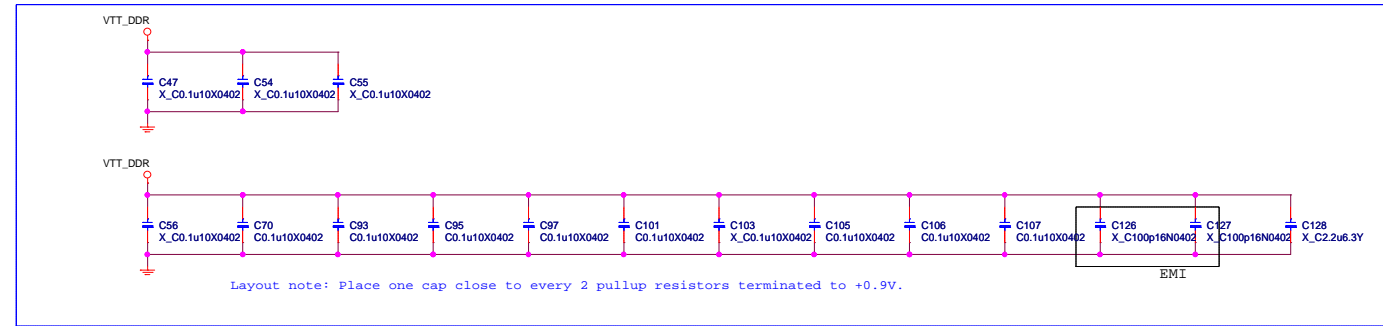
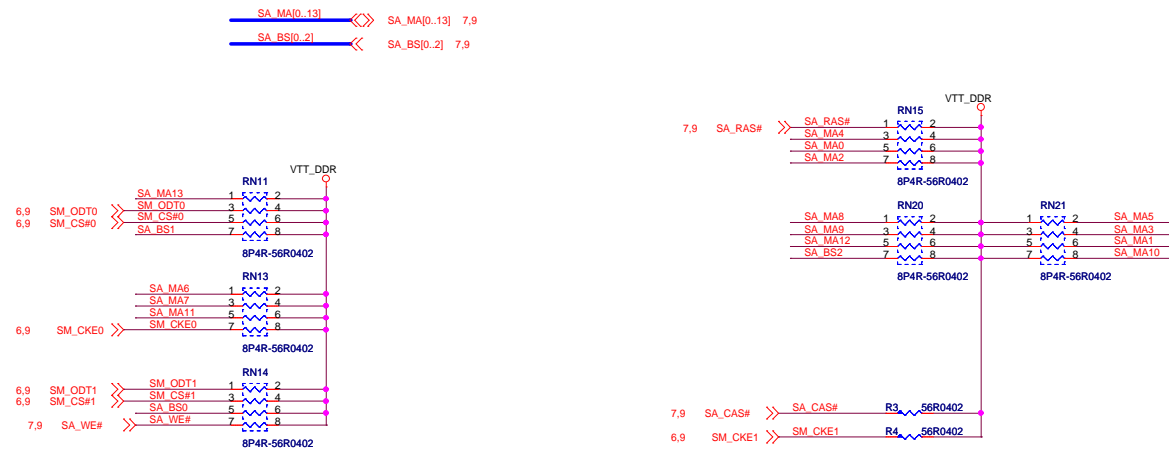
SA MD[0..63] SA_MD[0..63] 7
SA DM[0..7] SA_DM[0..7] 7
SA DQS[0..7] SA_DQS[0..7] 7
SA DQS#[0..7] SA_DQS#[0..7] 7
SA MA[0..13] SA_MA[0..13] 7,10
SA BS[0..2] SA_BS[0..2] 7,10

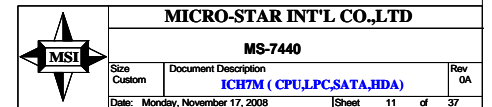


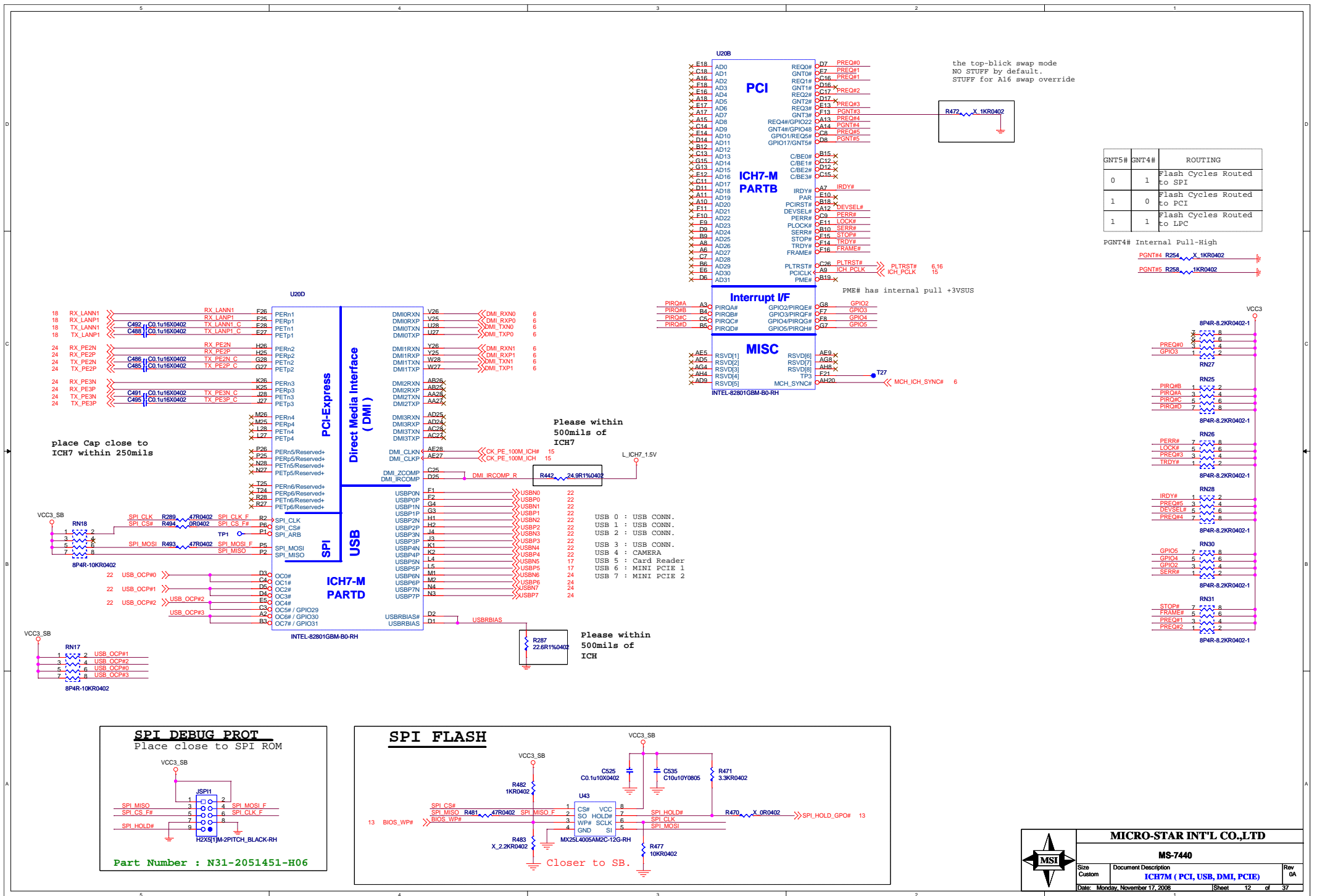
ADDRESS: 000
0xA0

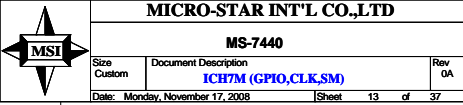


DIMM-200PS_BLACK-RH-1

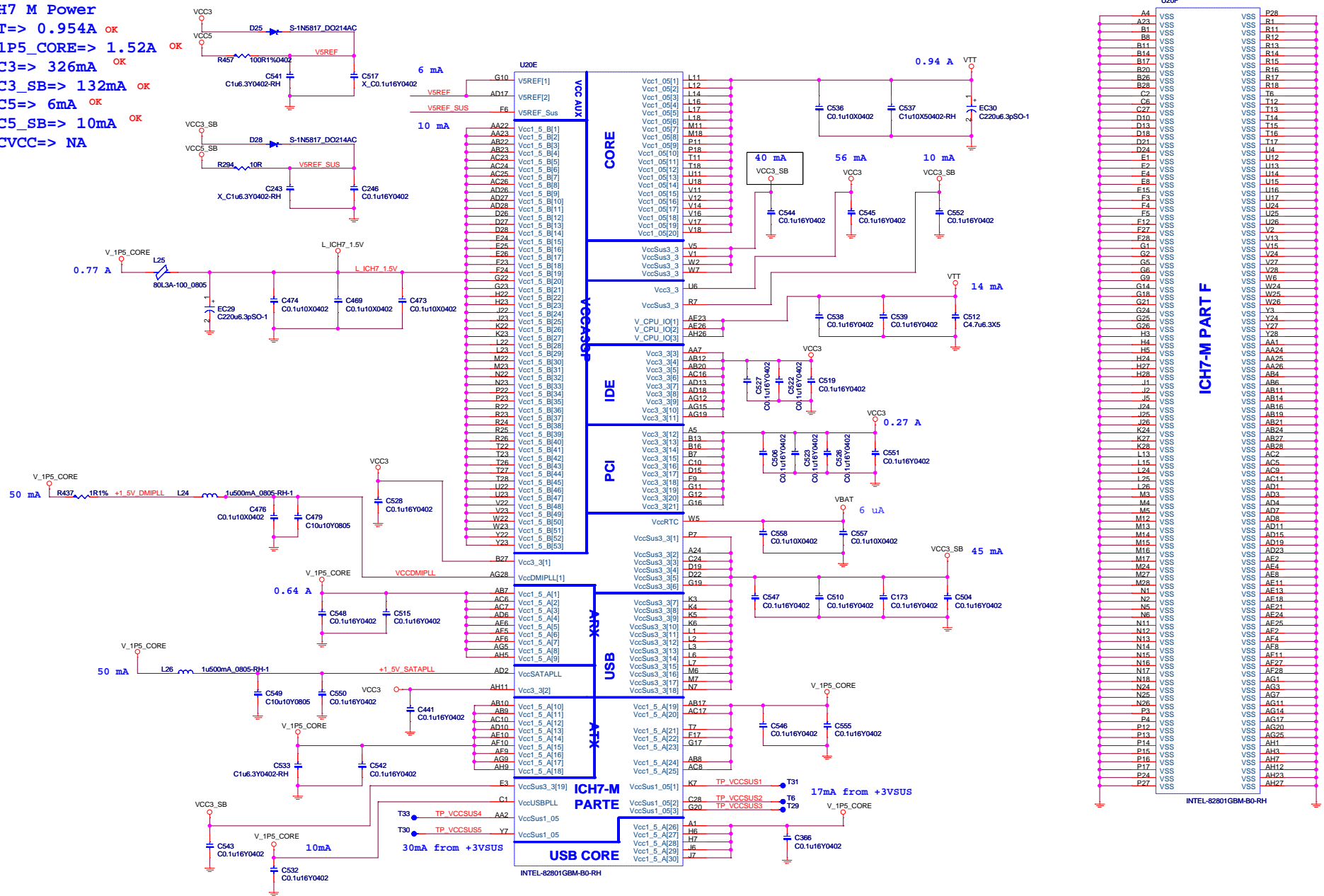






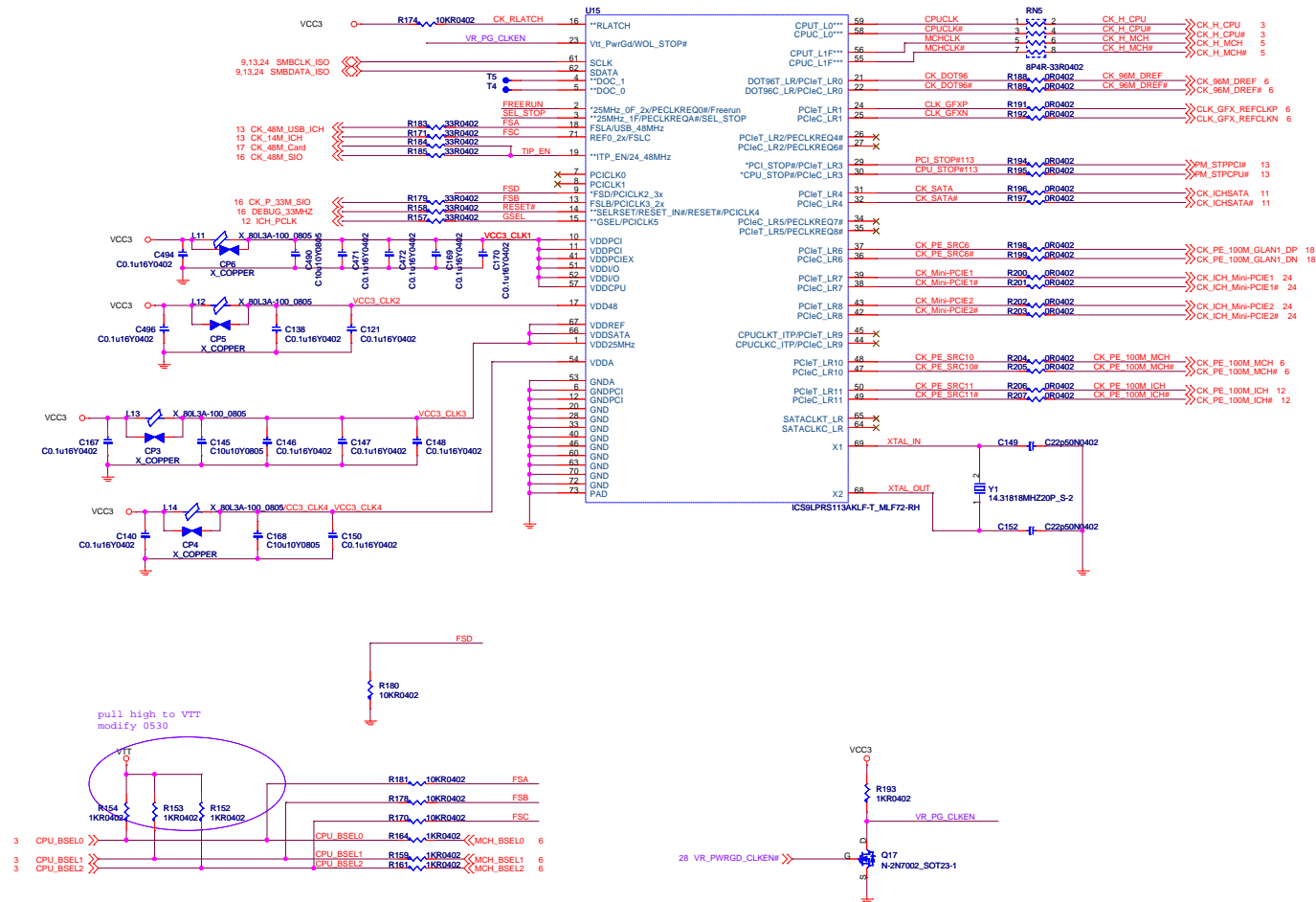


ICH7 M Power
 VTT=> 0.954A OK
 V_1P5_CORE=> 1.52A OK
 VCC3=> 326mA OK
 VCC3_SB=> 132mA OK
 VCC5=> 6mA OK
 VCC5_SB=> 10mA OK
 RTCVCC=> NA



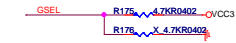
PIN AA2,Y7,K7,C28,G20 : VccSus 1.05V for RTCVCC

CLK Gen ICS9LPRS113



CLOCK GEN STRAPPING

1 => Pin2/22 90MHz
0 => Pin2/22 100MHz



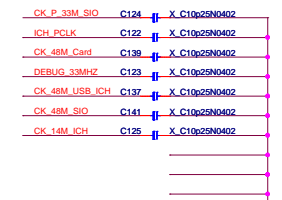
LPC1CLK4
HRESET*
to be WDT res=> HI



113
TIP_EN=0 => PCIE9,
TIP_EN=1 => CPU_JTP



Selects pin 29/830
1 = PCI_STOP#/CPU_STOP#
0 =PCIE9 CLK output



CPU Table

BSEL[2]	BSEL[1]	BSEL[0]	BCLK
L	L	L	100MHZ
L	L	H	133MHZ
L	H	L	RESERVED
L	H	H	166MHZ

CLK Gen 113

BSEL[2]	BSEL[1]	BSEL[0]	BCLK
H	L	H	100MHZ
L	L	H	133MHZ
L	H	L	200MHz
L	H	H	166MHZ



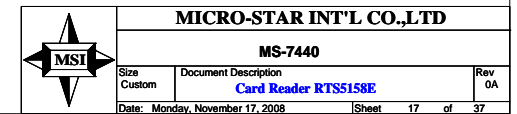
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Size Custom Document Description CLK GEN [ICS9LPRS113]

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Flash Card Socket



Video Connector

change ESD diode
modify 0609

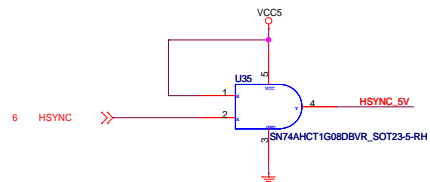
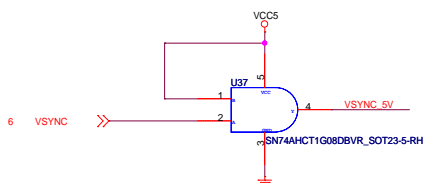
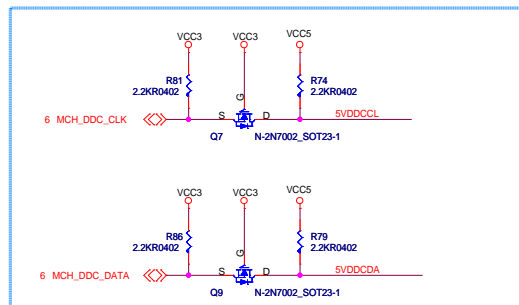
37.5ohm/9mil
trace width

6 VGA_RED >> VGA_RED
6 VGA_GREEN >> VGA_GREEN
6 VGA_BLUE >> VGA_BLUE

PLACE CLOSE TO MCH,
WITHIN 500 MIL OF
PIN

PLACE CLOSE TO VGA CONNECTOR

55ohm/4mil
trace
width
max 600mil

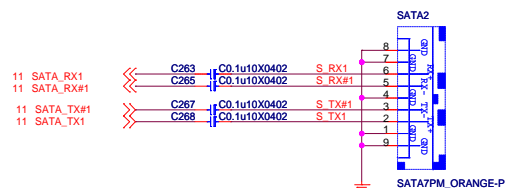
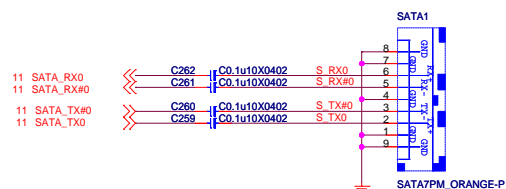


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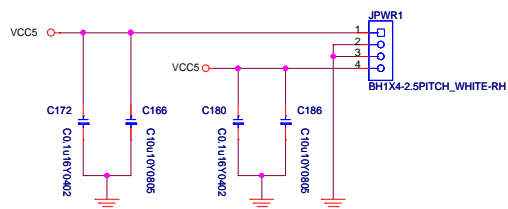
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SERIAL ATA CONNECTOR BLOCK



HDD Power For 2.5"

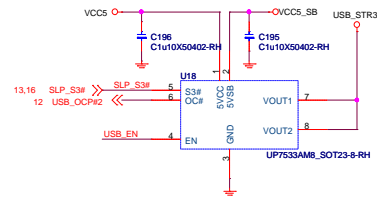


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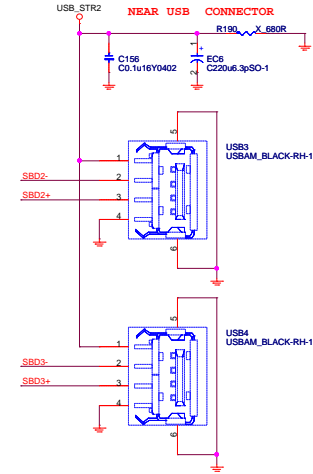
MS-7440

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POWER CIRCUIT FOR USB PORT 4

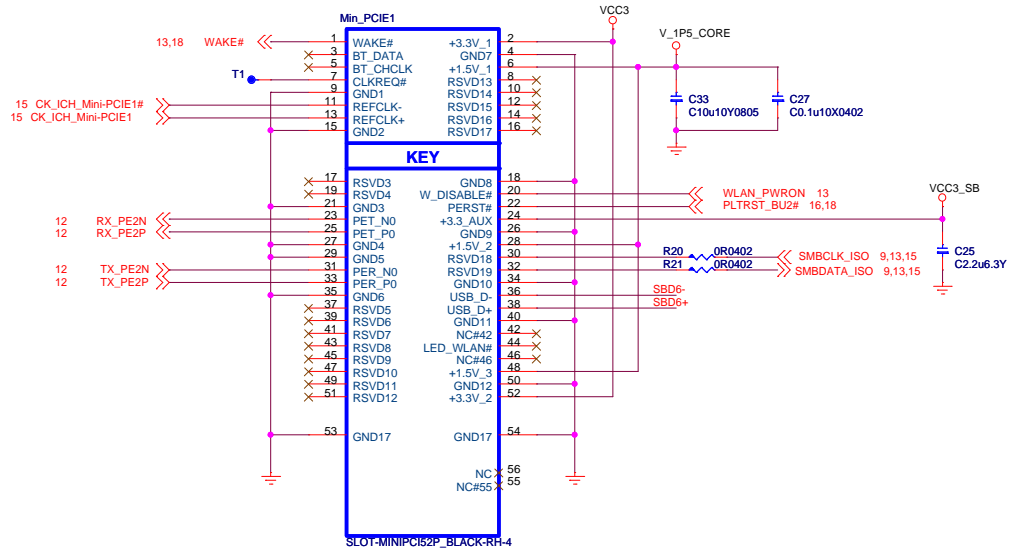


USB_STR2 NEAR USB CONNECTOR

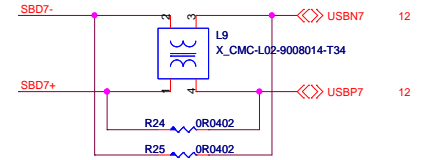
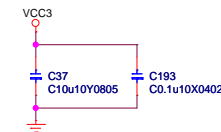
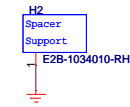
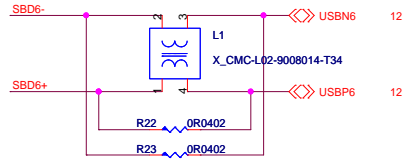
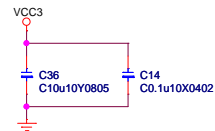
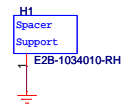
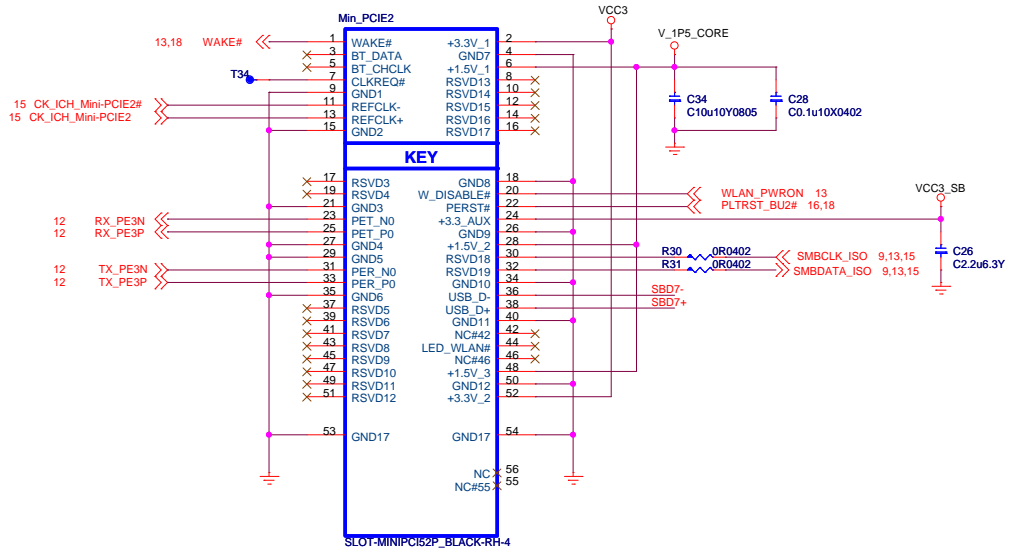


The schematic diagram illustrates the electrical interface between a camera module and a USB-to-camera interface. The camera module (top) features a VCC3 supply, a network of resistors (R518, R519, R578), capacitors (C801, C600, C596, EC9, C220u3p50-1), and a MOSFET (Q46). It also includes a USB connection (USB_STR3) and a camera-specific component (X_OR8005). The interface module (bottom) includes a USB-to-camera converter (Q47), a network of resistors (R520, R522, R521), capacitors (C602, C604, C603), and a camera-specific component (X_C22p50ND402). The connections are labeled with pin numbers 12 and 13, indicating the interface pins.

Mini PCI-E Slot 1



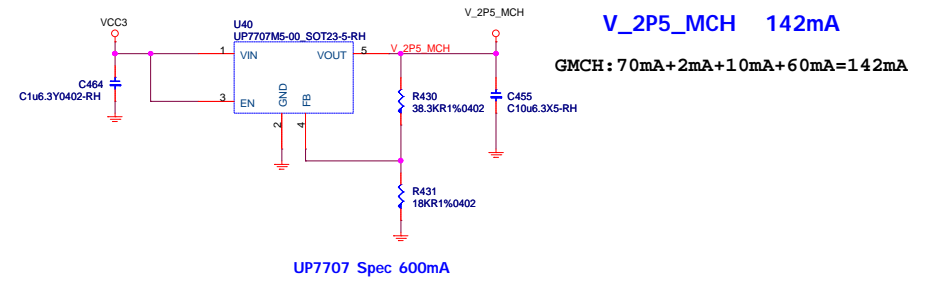
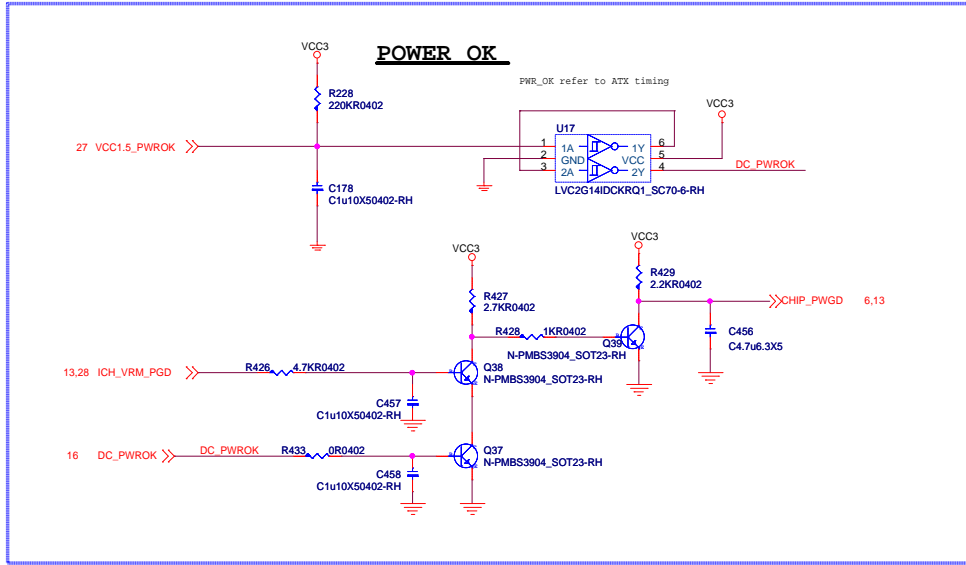
Mini PCI-E Slot 2



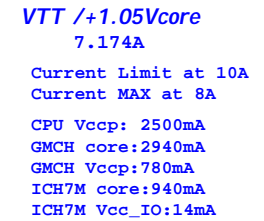
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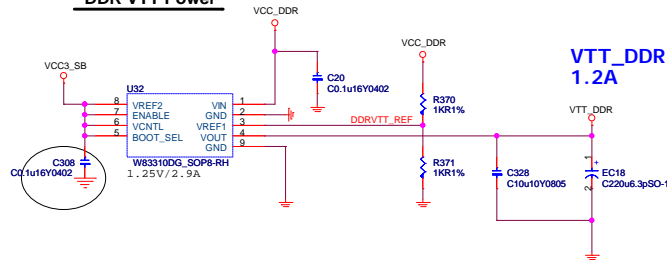
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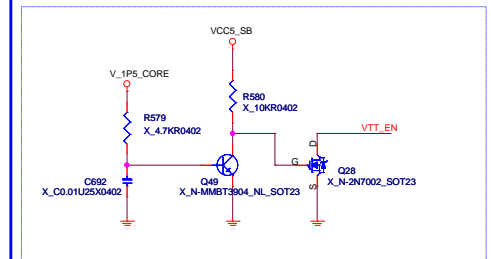
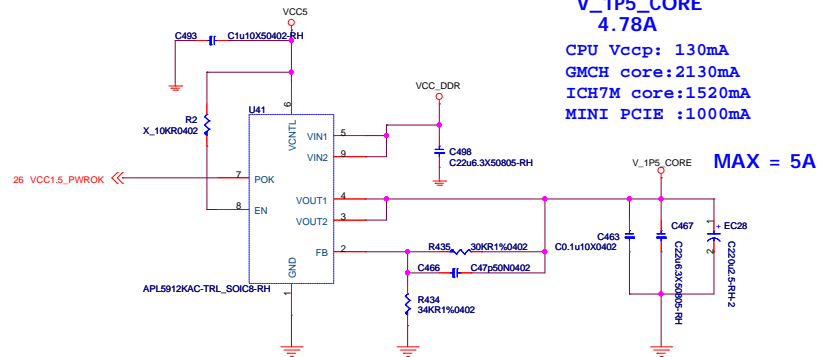
MAX = 9.2A



To CPU Copper trace width > 250mils , Fill
island behind DIMM > 400mils .



```
CPU Vccp: 130mA
GMCH core:2130mA
ICH7M core:1520mA
MINI PCIE :1000mA
```

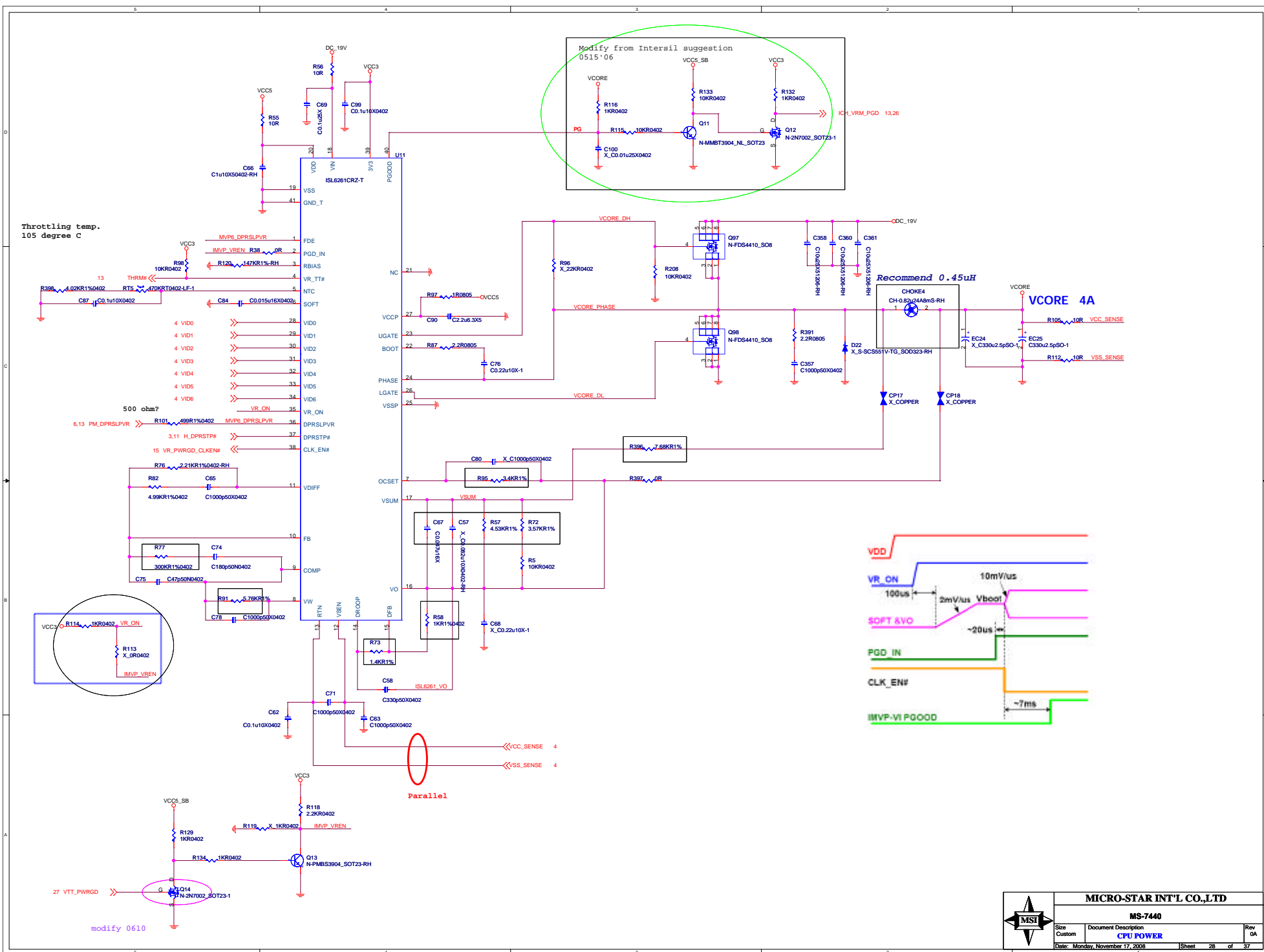


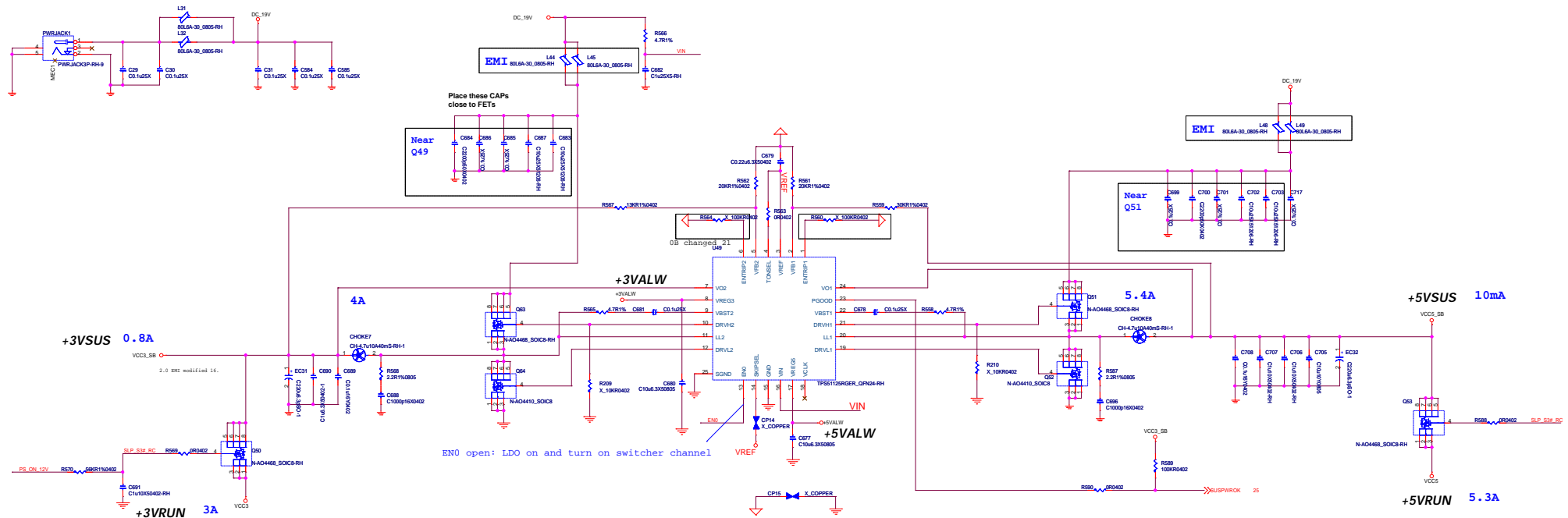
reserved for power sequence error



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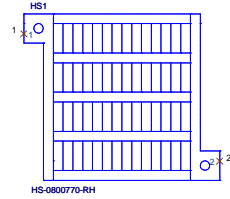
Size Custom	Document Description GMCH VCORE	Rev 0A
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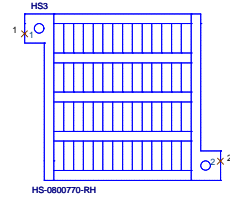




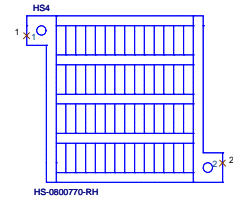
CPU HEATSINK



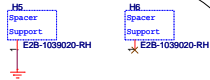
SB HEATSINK



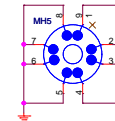
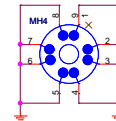
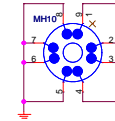
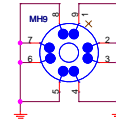
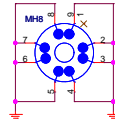
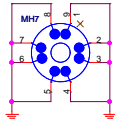
NB HEATSINK



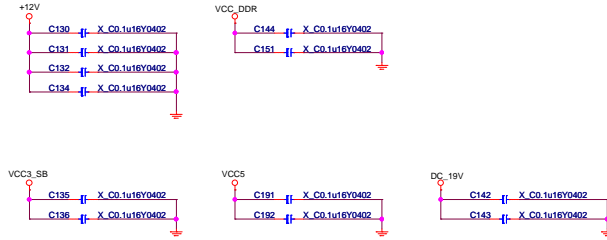
FOR 1R MODULE



Mounting Holes

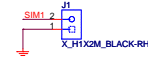


EMI

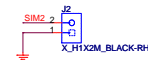


Simulation

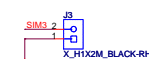
Layer1 / 5mil / 55ohm



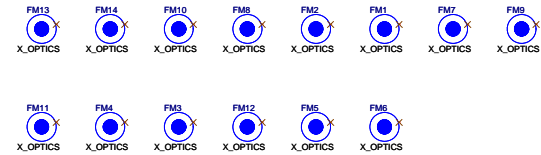
Layer4 / 4.5mil / 55ohm



Layer6 / 5mil / 55ohm



Optics Orientation Holes



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ICH7M

GPIO	Alt Func	Pin	I/O/NC	Power	PU	SMI	Tol	Default	Rickles Signal Name
GPIO[0]	BM_BUSY#	AB18	I	VCC3p3	N	Y	3.3	N/A	PM_BMBUSY#
GPIO[1]	REQ[5]#	C8	I	V5REF	Y	N	5	N/A	PREQ#5
GPIO[2]	PIRQE#	G8	I	V5REF	Y	N	5	N/A	GPIO2
GPIO[3]	PIRQF#	F7	I	V5REF	Y	N	5	N/A	GPIO3
GPIO[4]	PIRQG#	F8	I	V5REF	Y	N	5	N/A	GPIO4
GPIO[5]	PIRQH#	G7	I	V5REF	Y	N	5	N/A	GPIO5
GPIO[6]	unmuxed	AC21	I	Vcc3p3	Y	Y	3.3	N/A	ATADET0
GPIO[7]	unmuxed	AC18	I	Vcc3p3	Y	N	3.3	N/A	SIO_OVT#
GPIO[8]	unmuxed	E21	I	VccSus3p3	Y	Y	3.3	N/A	NC
GPIO[9]	unmuxed	E20	I	VccSus3p3	Y	N	3.3	N/A	NC
GPIO[10]	unmuxed	A20	I	VccSus3p3	Y	N	3.3	N/A	NC
GPIO[11]	SMBALERT#	B23	I	VccSus3p3	Y	Y	3.3	N/A	SMBALERT#
GPIO[12]	unmuxed	F19	I	VccSus3p3	Y	N	3.3	N/A	SPI_HOLD_GPO#
GPIO[13]	unmuxed	E19	I	VccSus3p3	Y	Y	3.3	N/A	SIO_PME#
GPIO[14]	unmuxed	R4	I	VccSus3p3	Y	Y	3.3		NC
GPIO[15]	unmuxed	E22	I	VccSus3p3	N	N	3.3	1	NC
GPIO[16]	DPRSPLPVR	AC22	O	Vcc3p3	N	N	3.3	1	DPRSPLPVR
GPIO[17]	GNT[5]#	D8	O	Vcc3p3	N	N	3.3	1	PGNT#5
GPIO[18]	STPPCI#	AC20	O	Vcc3p3	N	N	3.3	1	PM_STPPCI#
GPIO[19]	SATA1GP	AH18	I	Vcc3p3	D	N	3.3	1	SATA1GP
GPIO[20]	STPCPU#	AF21	O	Vcc3p3	N	N	3.3	0	PM_STPCPU#
GPIO[21]	SATA0GP	AF19	I	Vcc3p3	N	N	3.3	0	SATA0GP
GPIO[22]	REQ4#	A13	I	Vcc3p3	N	N	3.3	0	PREQ#4
GPIO[23]	LDRQ1#	AA5	O	Vcc3p3	N	N	3.3		NC
GPIO[24]	unmuxed	B3	O	VccSus3p3	Y	N	3.3	1	BIOS_WP#
GPIO[25]	unmuxed	D20	O	VccSus3p3	N	N	3.3	N/A	CAMERA_ON#
GPIO[26]	unmuxed	A21	O	VccSus3p3	N	N	3.3	0	NC
GPIO[27]	unmuxed	B21	O	VccSus3p3	N	N	3.3	0	NC
GPIO[28]	unmuxed	E23	O	VccSus3p3	N	N	3.3	0	NC
GPIO[29]	OC#5	C3	I	VccsUS3p3	Y	N	3.3		USB_OCP#2
GPIO[30]	OC#6	A2	I	VccsUS3p3	Y	N	3.3		USB_OCP#3
GPIO[31]	OC#7	B3	I	VccsUS3p3	Y	N	3.3		USB_OCP#3
GPIO[32]	CLKRUN#	AG18	O	Vcc3p3	N	N	3.3	1	CLKRUN#
GPIO[33]	AZ_DOCK_EN#	AC19	O	Vcc3p3	N	N	3.3	1	PRES2
GPIO[34]	AZ_DOCK_RST#	U2	O	Vcc3p3	N	N	3.3	0	PRES3
GPIO[35]	SATACLKREQ#	AD21	O	Vcc3p3	N	N	3.3	0	PRES1
GPIO[36]	SATA2GP	AH19	I	Vcc3p3	N	N	3.3	0	SATA2GP
GPIO[37]	SATA3GP	AE19	I	Vcc3p3	N	N	3.3	0	SATA3GP
GPIO[38]	unmuxed	AD20	I	Vcc3p3	Y	N	3.3	1	NC
GPIO[39]	unmuxed	AE20	I	Vcc3p3	Y	N	3.3	1	WLAN_PWRON
GPIO[48]	GNT4#	A14	O	Vcc3p3	N	N	3.3	1	PGNT#4
GPIO[49]	CPUPWRGD	AG24	OD	V_FSB_VTT	Y	N	3.3	1	CPU_PWRGD

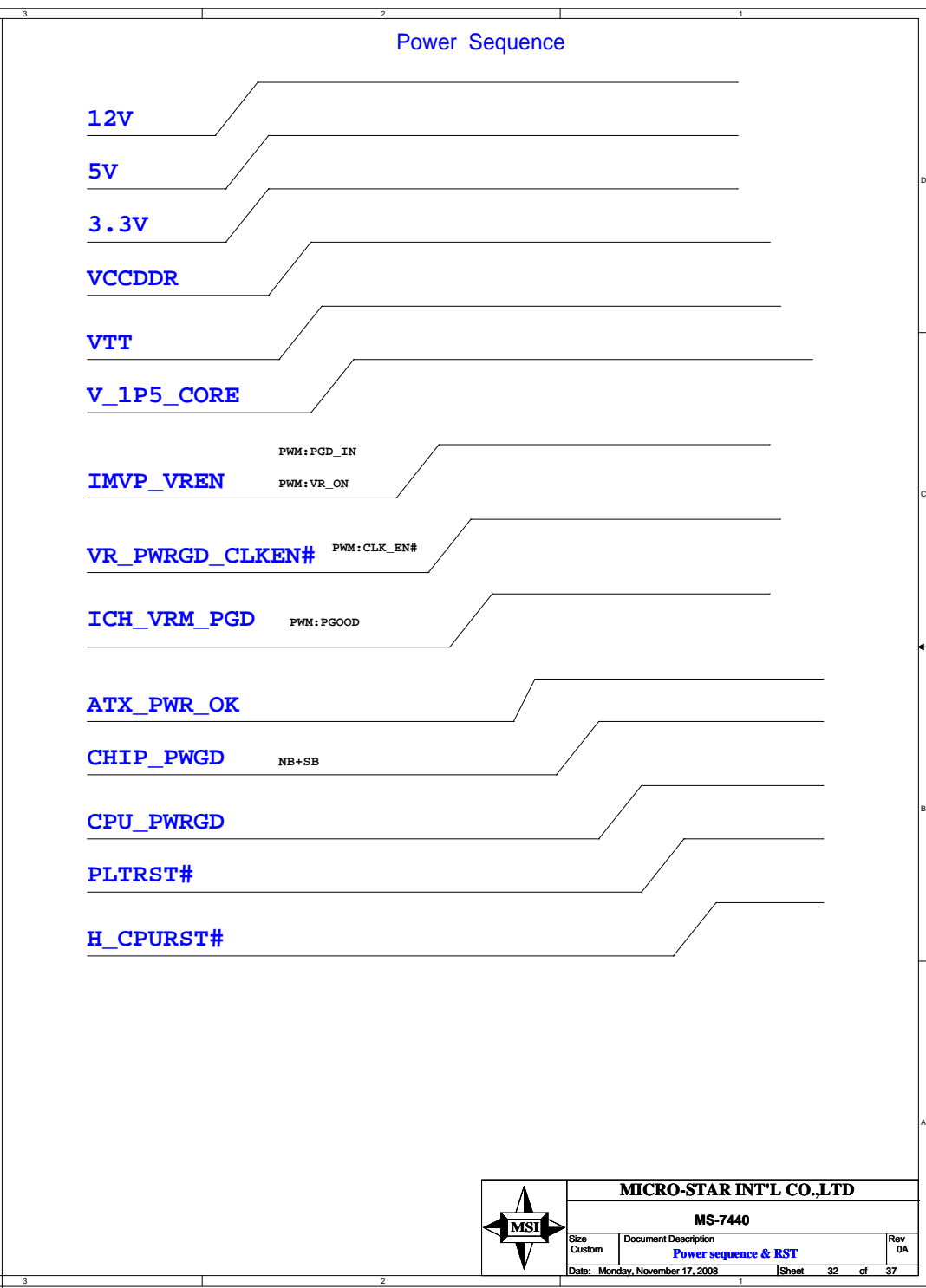
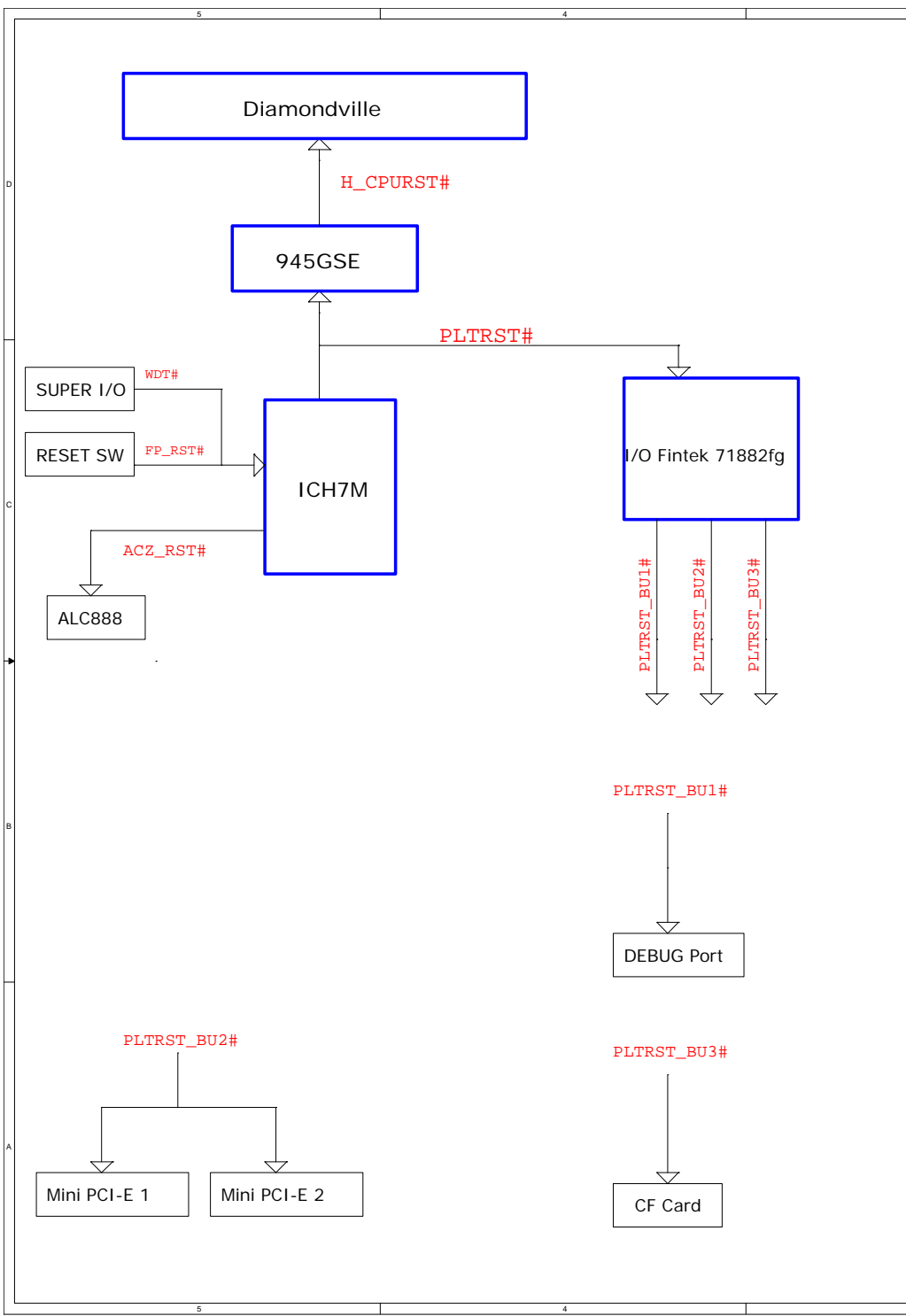
SIO(F71882)

PIN NAME	USAGE	Input/Output	NOTES
GPIO[2:0]	UNUSED		
GPIO3	UNUSED		
GPIO4	UNUSED		
GPIO5	UNUSED		
GPIO6	UNUSED		
GPIO7	WDT#	OUTPUT	WATCH DOG TIMER RESET OUTPUT
GPIO10	UNUSED		
GPIO11	UNUSED		
GPIO12	UNUSED		
GPIO13	BEEP	OUTPUT	
GPIO14	AMP_EN	OUTPUT	RESERVED TO ENABLE THE AMPLIFIER
GPIO15	LED_VSB	OUTPUT	OUTPUT FOR PWR LED
GPIO16	LED_VCC	OUTPUT	OUTPUT FOR PWR LED
GPIO17	UNUSED		
GPIO20	PLTRST_BU#1	OUTPUT	PCI RESET BUFFER1
GPIO21	PLTRST_BU#2	OUTPUT	PCI RESET BUFFER2
GPIO22	PLTRST_BU#3	OUTPUT	PCI RESET BUFFER3
GPIO23	UNUSED		
GPIO24	UNUSED		
GPIO26	PSIN	INPUT	FRONT PANNEL POWER BUTTON
GPIO27	PSOUT#	OUTPUT	POWER BUTTON BUFFER OUT TO SB
GPIO30	SLP_S3#	INPUT	FROME SOUTHBRIDGE S3#
GPIO31	PS_ON#	OUTPUT	OUTPUT FOR POWER ON
GPIO32	UNUSED		
GPIO33	RSMRST#	OUTPUT	OUTPUT FOR SOUTHRBRIDGE RSMRST#
GPIO40	AMP_GAIN0	OUTPUT	SET AMPLIFIER GAIN
GPIO41	UNUSED		
GPIO42	UNUSED		
GPIO43	AMP_GAIN1	OUTPUT	SET AMPLIFIER GAIN

DDR-II DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	00	SM_CK0/#0 SM_CK1/#1

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MS-7440			
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ATOM N270			
0.65V - 1.2V Core	-	4A	
1.05V Vtt	-	2.5 A	
1.5V VCCA	-	130mA	

945GME GMCH TDP: 14 - 16W			
1.05V Vtt	-	780mA	
1.05V Core(integrated GFX)	-	2.94A	
1.8V DDR2 I/O	-	1.72A	
2.5V CRTDAC	-	142mA	
2.5V LVDS	-		
1.5V PLL	-	2.13A	
3.3V VCC3	-	40mA	

ICH7-M			
1.05V VTT	-	0.954A	
1.5V Core	-	1.41A	
1.5V USB	-	10mA	
1.5V SATA	-	50mA	
1.5V DMI	-	50mA	
+3.3V VccSus	-	132mA	
RTC (G3)	-	5uA	
5VRef	-	6mA	
5VrefSus	-	10mA	
+3.3V	-	326mA	

HD Audio ALC888			
3.3V AUDIO	-	40mA	
5V AUDIO	-	200mA	

CLK Gen 113 3VRUN			
3.3V	-	200mA	

Cardreader 3VRUN			
3.3V	-	170mA	



ISL6261			
VCORE			
0.7625-1.325V			
1-Phase Switch	4A		

W83310DS			
VTT_DDR			
0.9V Linear	1.2A		

TPS51124RGER			
VTT			
1.05V Switch	7.174A		
VCC_DDR			
1.8V Switch	9.2A		

V_1P5_Core			
1.5V Linear	4.78A		
TPS51125			
VCC3 Switch	3A		
VCC5 Switch	5.3A		
VCC3_SB	0.8A		
VCC5_SB	10mA		

UP7707			
V_2P5_MCH			
2.5V Linear	142mA		

MP8670DN			
+12V	0.5A+?A		
LT1087S			
	0.1A		

DDR2 SDRAM & TERMINATOR			
0.9V VTT_DDR	-	1.2A	
1.8V VCC_DDR (S0,S1)	-	2.7A	

MINI PCI-Express slot 1			
V_1P5_Core	-	500mA	
+3.3VSB	-	330mA	
+3.3V	-	1.0A	

MINI PCI-Express slot 2			
V_1P5_Core	-	500mA	
+3.3VSB	-	330mA	
+3.3V	-	1.0A	

USB			
+5V (S0,S1)	-	2.5A	

SYS FAN			
+12V	-	0.4A	

PS/2			
+5V (S0,S1)	-	345mA	
+5V	-	2.0mA	

SATA HDD 2.5" POWER			
+5V		1A	

SATA ODD DVD-ROM			
+5V		1.3A	

Panel POWER 17W			
+12V		?A	

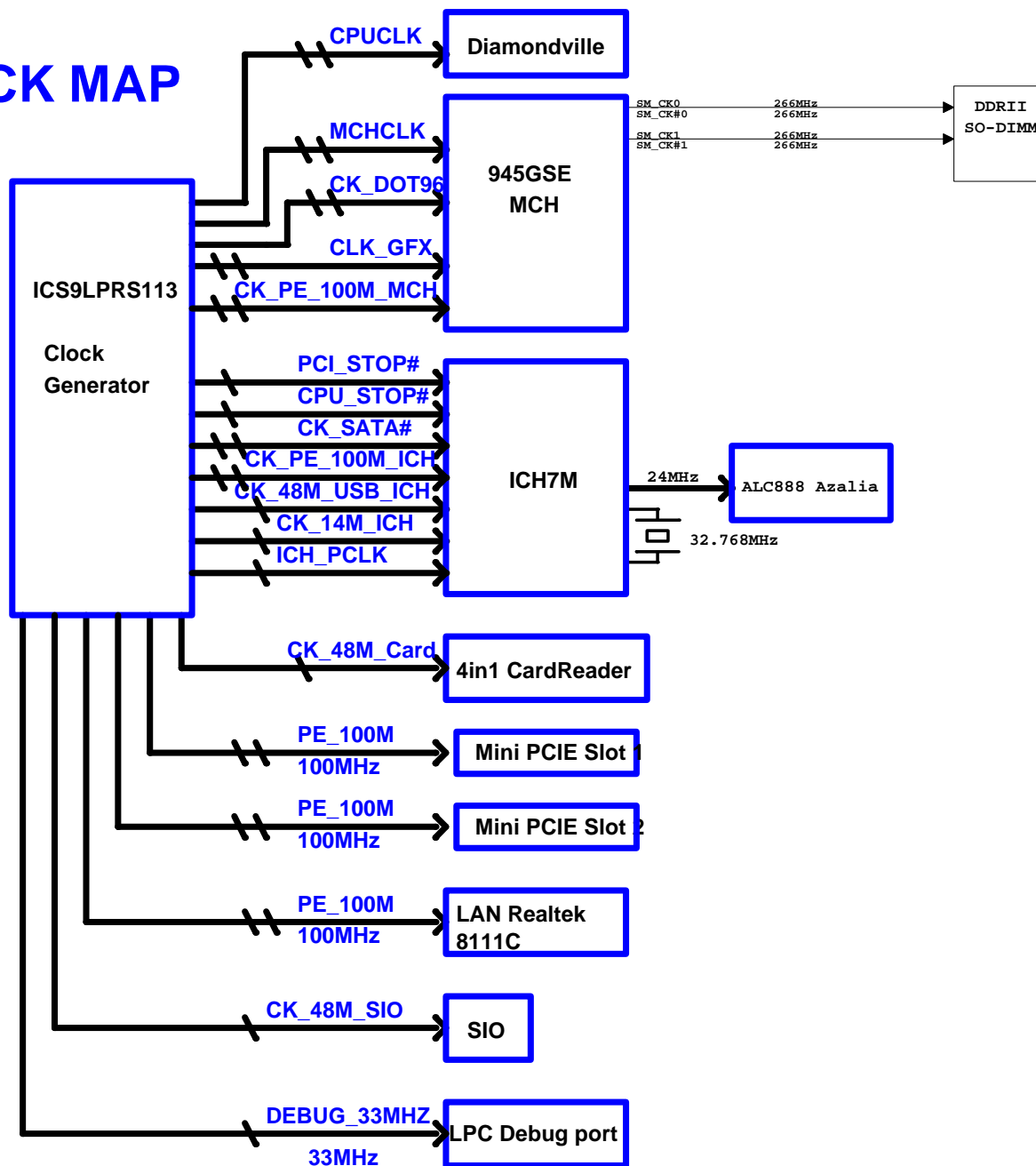
AOC Total = MAX 57 W (no Panel)
Channel Total = MAX 67 W (no Panel)

DC_IN (+19V)

VCC3 + VCC3_SB = MAX 3.8A
VCC5 + VCC5_SB = MAX 5.4A
+12V = MAX 0.8A
VTT 1.05V = MAX 7.2A
VCC_DDR 1.8V = MAX 9.2A

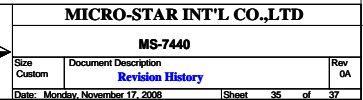
MICRO-STAR INT'L CO.,LTD			
MS-7440			
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CLOCK MAP



1	Remove mini pci-e 2	
2	Remove CF Care	
3	Change System Fan	
4	LED1,LED2,LED3,LED4 NO STUFF	
5	Remove 7308 function (NO STUFF)	
6	Add Touch Panel Connector (USB)	P.22
7	Change JVGA1 and SO-DIMM Footprint	P.19 P.9
8	Change Min_PCIE1 and Min_PCIE1 and H1 and H2 Footprint	P.24
9	LCTLA_CLK and LCTLB_DATA pull-up to 3.3 V (LVDS)	P.06
10	LIBG pulled-down to GND (LVDS)	P.06
11	PS_ON# Pull-up VCC5_SB	P.25
12	PSOUT# and ATXPG_IN Pull-up VCC3_SB	P.13 P.16
13	C90 Change to C11-2257013-W08 (X5R)	P.28
14	L1/L9/RN33 SWAP (layout require)	P.24 P.18
15	PWR_LED and SUS_LED Add control signal SLP_S5#	P.25 09/23
16	RN16 change to 220 ohm	P.25 09/23
17	add test point (T25,T26,T35,T38~T316)	09/23
18	7308 NO STUFF	P.20 09/24
19	RN30/RN27/RN19/RN18/RN32 SWAP (layout require)	P.20 09/24
20	Remove Q49 And Change to Q63,Q64 For VCC3_SB	P.29 09/24
21	Remove Q35 And Change to Q97,Q98 For VCORE	P.28 09/24
22	RN31/RN26/RN8 SWAP (layout require)	09/25
23	Keyboard/mouse power change to VCC5_SB	P.16 09/25
24	C236,C565,C237,C234,C574,C553,C554,C582,C583,C567,C576,C575,C563,C559,C556,C577,C581 change rating to 25V and add CP19	P.23 09/25
25	Remove RN1 and add R970/R971	P.25 09/25
26	Add buffer circuit for GPIO6/GPIO8/GPIO9	P.25 09/25
27	Remove R346 and U29 PIN 8 through 4.7K connect to U29 PIN 24, Delay Time (Let VTT slower than VCC_DDR)	P.27 09/25
28	SB heatsink change to E31-0800771-K08	P.30 09/26
29	JFP2 change to N31-2071101-H06 (add HDD_LED)	P.25 09/26
30	Add stand off H5/H6 (IR module)	P.30 09/26

	MICRO-S	
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