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MS-7758

ATX
Ver: 4.0(304.8x202)

Intel -MahoBay platform B75

CPU:

IVY bridge LGA1155

System Chipset:

Panther Point B75

Onboard Chip:

HD Audio Codec:ALC892 colay 887

LAN-RTL8111E colay8105E

SIO:Fintek F71868AD

B75 Flash ROM: SPI 128 MB

Main Memory:

DDRIII (1066/1333/1600MHz) * 2 (Dual Channel)

ACPI:

UPI

PWM:

VRD12 -UT501 3+1 Phase

Expansion Slots:

PCI Express (X16) Slot * 1

PCI Express (X1) Slot * 2

PCI Slot * 3

Other: SATA3.0 x1+SATA2.0 x5 (B75)

USB2.0 *10

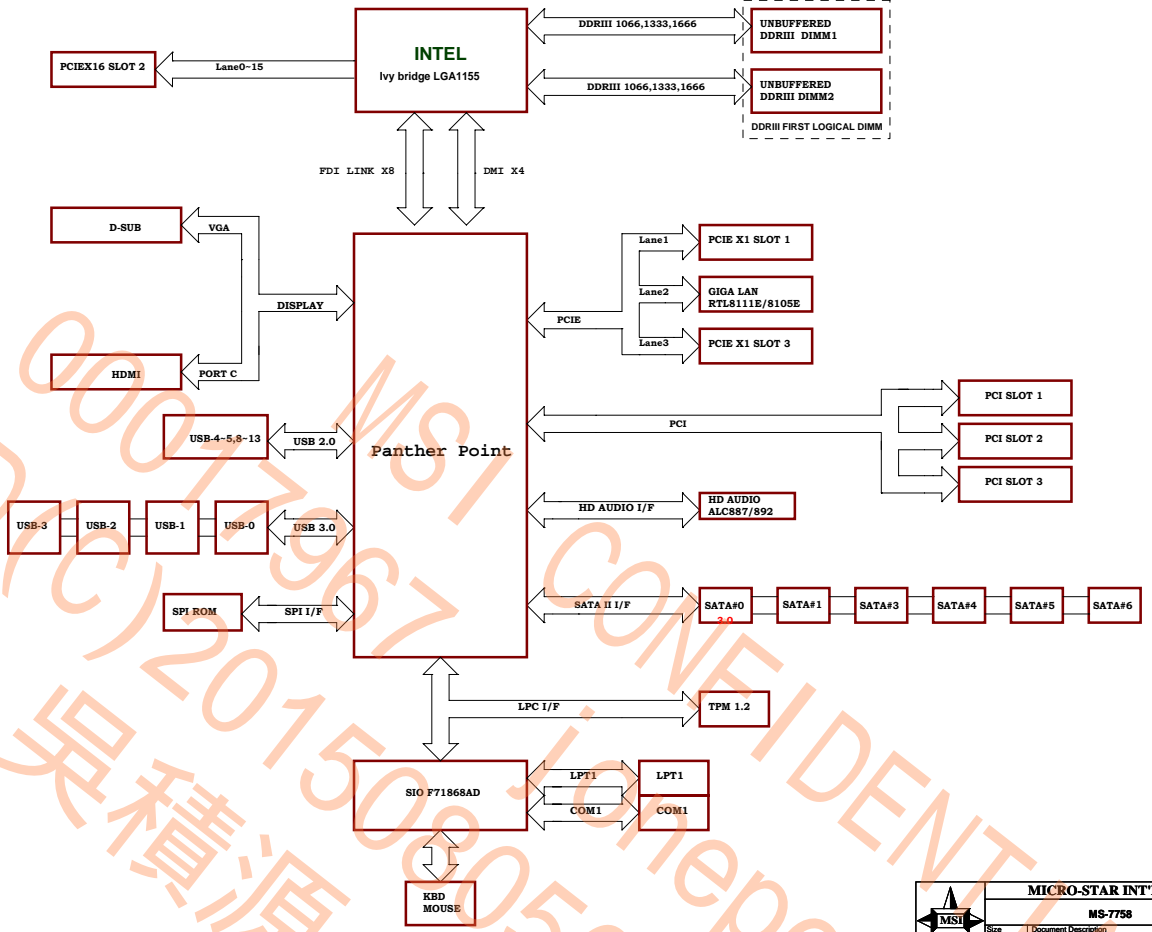
REAL USB3.0 *2

FRONT USB3.0 *2



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MS-7758		
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MS-7758-4.0 Block Diagram

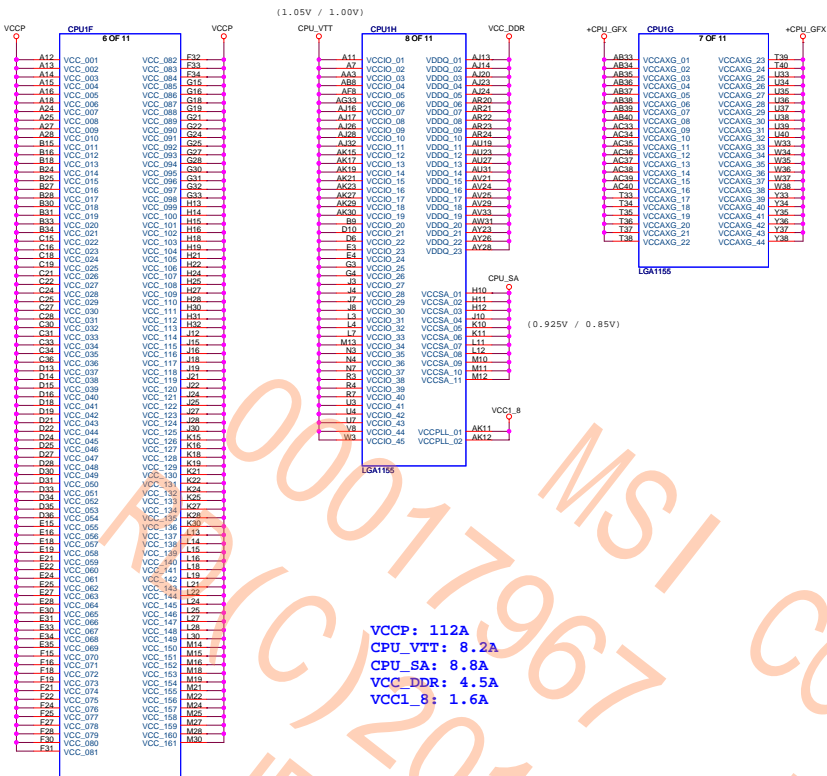


Slot Sequence:

- PCIE X1
- PCIE X16
- PCIE X1
- PCI SLOT
- PCI SLOT
- PCI SLOT

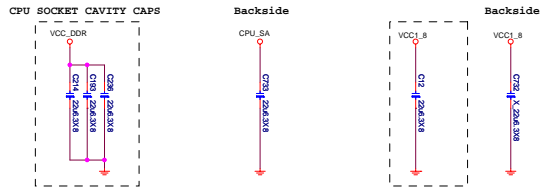
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RD (C) 2015080501 Chengpei (裴亮樂)
 吳積源 (00011601) RMA 工程師

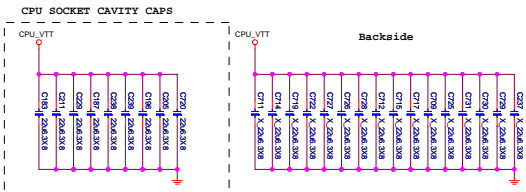


VCCP: 112A
 CPU_VTT: 8.2A
 CPU_SA: 8.8A
 VCC_DDR: 4.5A
 VCC1_8: 1.6A

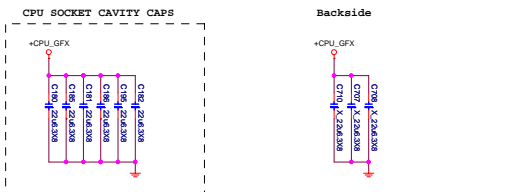
+1.5V_DDR3-Decoupling **+CPU_SA Decoupling** **+VCC1_8 Decoupling**



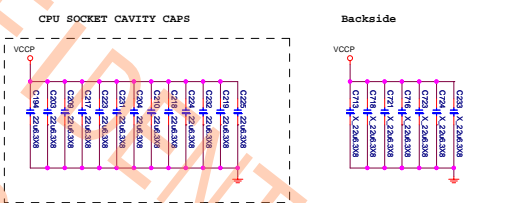
+CPU_VTT Decoupling



+CPU_GFX Decoupling



+CPU_VCCP-Decoupling



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MS-7758

Size: Custom Document Description: CPU-Power Rev: 4.0

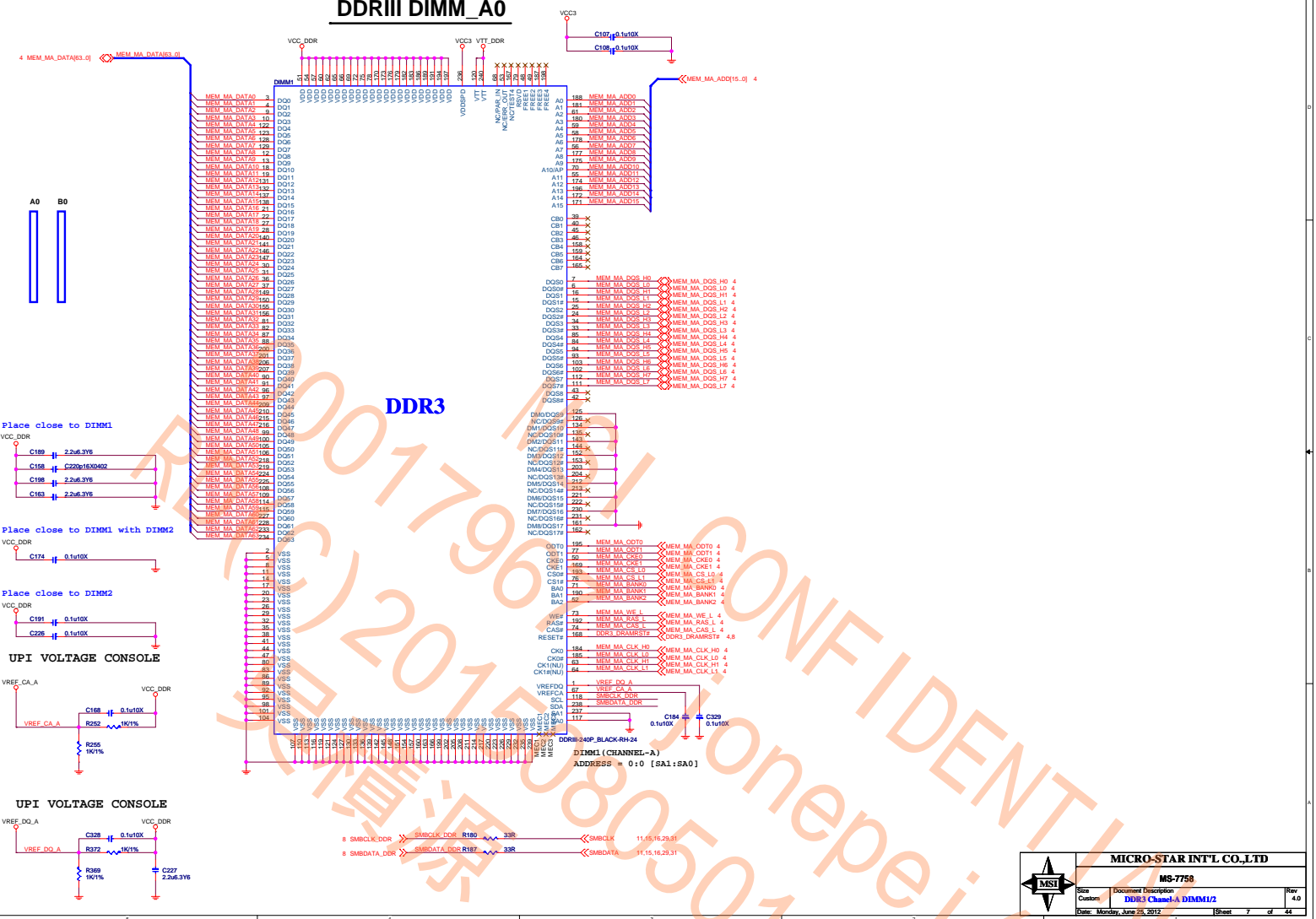
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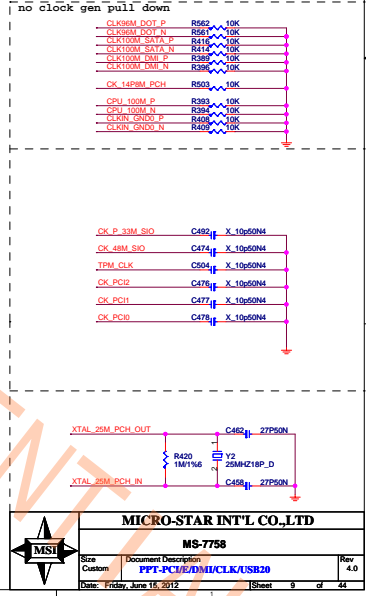
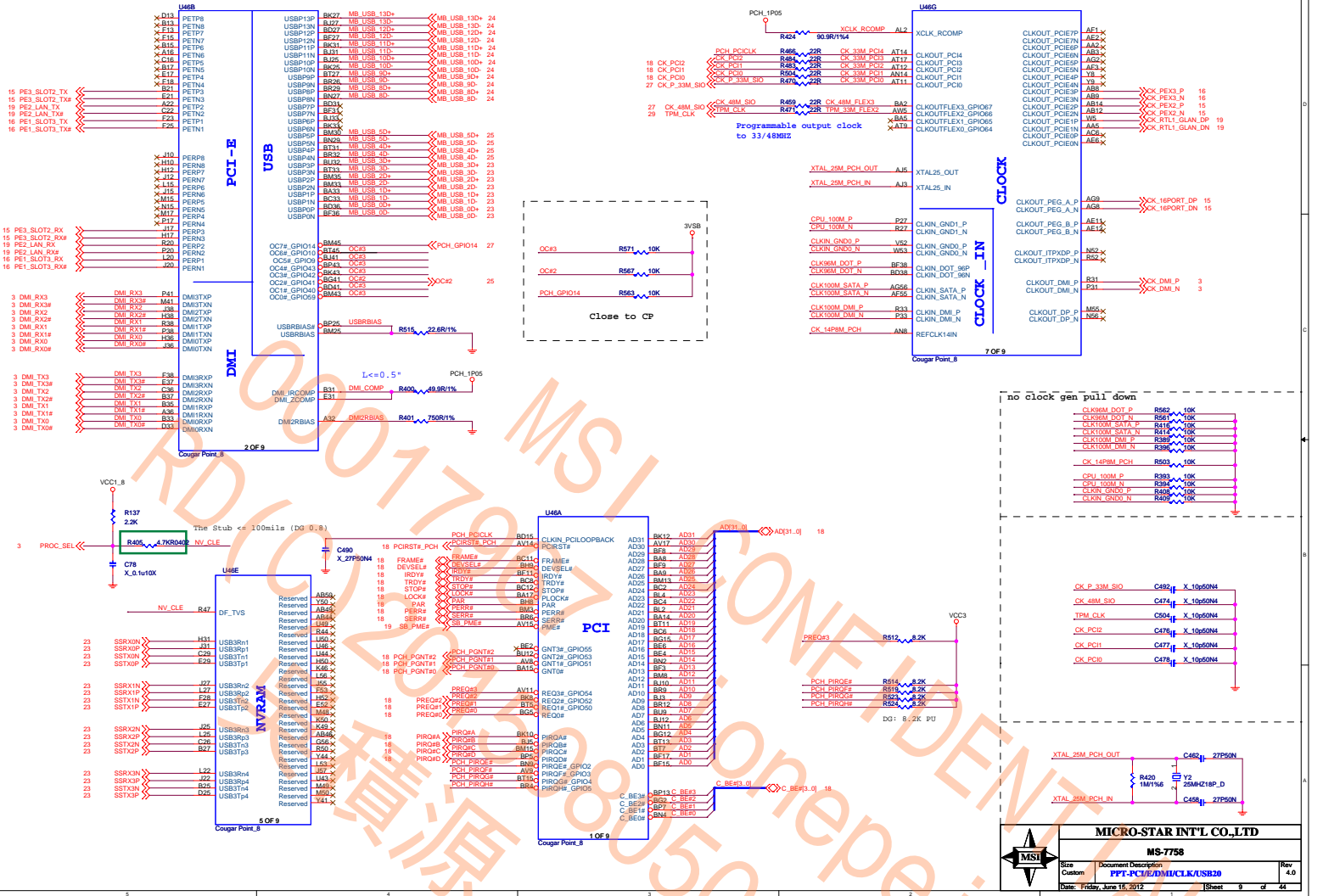
CPU1J 9 OF 11		
AM27	VSS_001	VSS_091
AM28	VSS_002	VSS_092
AM29	VSS_003	VSS_093
AM30	VSS_004	VSS_094
AM31	VSS_005	VSS_095
AM32	VSS_006	VSS_096
AM33	VSS_007	VSS_097
AM34	VSS_008	VSS_098
AM35	VSS_009	VSS_099
AM36	VSS_010	VSS_100
AM37	VSS_011	VSS_101
AM38	VSS_012	VSS_102
AM39	VSS_013	VSS_103
AM40	VSS_014	VSS_104
AM41	VSS_015	VSS_105
AM42	VSS_016	VSS_106
AM43	VSS_017	VSS_107
AM44	VSS_018	VSS_108
AM45	VSS_019	VSS_109
AM46	VSS_020	VSS_110
AM47	VSS_021	VSS_111
AM48	VSS_022	VSS_112
AM49	VSS_023	VSS_113
AM50	VSS_024	VSS_114
AM51	VSS_025	VSS_115
AM52	VSS_026	VSS_116
AM53	VSS_027	VSS_117
AM54	VSS_028	VSS_118
AM55	VSS_029	VSS_119
AM56	VSS_030	VSS_120
AM57	VSS_031	VSS_121
AM58	VSS_032	VSS_122
AM59	VSS_033	VSS_123
AM60	VSS_034	VSS_124
AM61	VSS_035	VSS_125
AM62	VSS_036	VSS_126
AM63	VSS_037	VSS_127
AM64	VSS_038	VSS_128
AM65	VSS_039	VSS_129
AM66	VSS_040	VSS_130
AM67	VSS_041	VSS_131
AM68	VSS_042	VSS_132
AM69	VSS_043	VSS_133
AM70	VSS_044	VSS_134
AM71	VSS_045	VSS_135
AM72	VSS_046	VSS_136
AM73	VSS_047	VSS_137
AM74	VSS_048	VSS_138
AM75	VSS_049	VSS_139
AM76	VSS_050	VSS_140
AM77	VSS_051	VSS_141
AM78	VSS_052	VSS_142
AM79	VSS_053	VSS_143
AM80	VSS_054	VSS_144
AM81	VSS_055	VSS_145
AM82	VSS_056	VSS_146
AM83	VSS_057	VSS_147
AM84	VSS_058	VSS_148
AM85	VSS_059	VSS_149
AM86	VSS_060	VSS_150
AM87	VSS_061	VSS_151
AM88	VSS_062	VSS_152
AM89	VSS_063	VSS_153
AM90	VSS_064	VSS_154
AM91	VSS_065	VSS_155
AM92	VSS_066	VSS_156
AM93	VSS_067	VSS_157
AM94	VSS_068	VSS_158
AM95	VSS_069	VSS_159
AM96	VSS_070	VSS_160
AM97	VSS_071	VSS_161
AM98	VSS_072	VSS_162
AM99	VSS_073	VSS_163
AM100	VSS_074	VSS_164
AM101	VSS_075	VSS_165
AM102	VSS_076	VSS_166
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AM105	VSS_079	VSS_169
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AM107	VSS_081	VSS_171
AM108	VSS_082	VSS_172
AM109	VSS_083	VSS_173
AM110	VSS_084	VSS_174
AM111	VSS_085	VSS_175
AM112	VSS_086	VSS_176
AM113	VSS_087	VSS_177
AM114	VSS_088	VSS_178
AM115	VSS_089	VSS_179
AM116	VSS_090	VSS_180

CPU1J 10 OF 11		
AV11	VSS_181	VSS_281
AV12	VSS_182	VSS_282
AV13	VSS_183	VSS_283
AV14	VSS_184	VSS_284
AV15	VSS_185	VSS_285
AV16	VSS_186	VSS_286
AV17	VSS_187	VSS_287
AV18	VSS_188	VSS_288
AV19	VSS_189	VSS_289
AV20	VSS_190	VSS_290
AV21	VSS_191	VSS_291
AV22	VSS_192	VSS_292
AV23	VSS_193	VSS_293
AV24	VSS_194	VSS_294
AV25	VSS_195	VSS_295
AV26	VSS_196	VSS_296
AV27	VSS_197	VSS_297
AV28	VSS_198	VSS_298
AV29	VSS_199	VSS_299
AV30	VSS_200	VSS_300
AV31	VSS_201	VSS_301
AV32	VSS_202	VSS_302
AV33	VSS_203	VSS_303
AV34	VSS_204	VSS_304
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AV36	VSS_206	VSS_306
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AV38	VSS_208	VSS_308
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AV57	VSS_227	VSS_327
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AV59	VSS_229	VSS_329
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AV94	VSS_274	VSS_364
AV95	VSS_275	VSS_365
AV96	VSS_276	VSS_366
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AV100	VSS_280	VSS_370

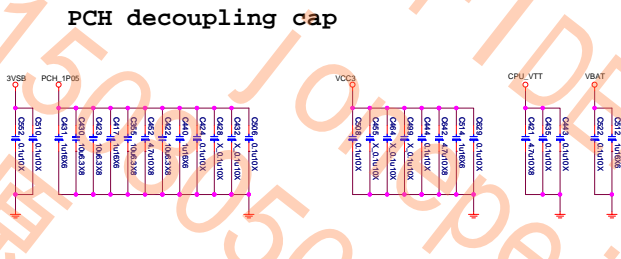
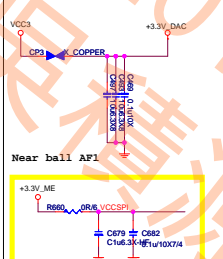
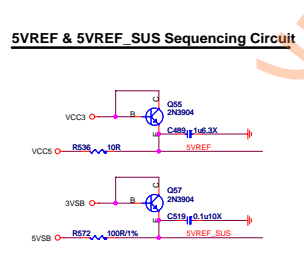
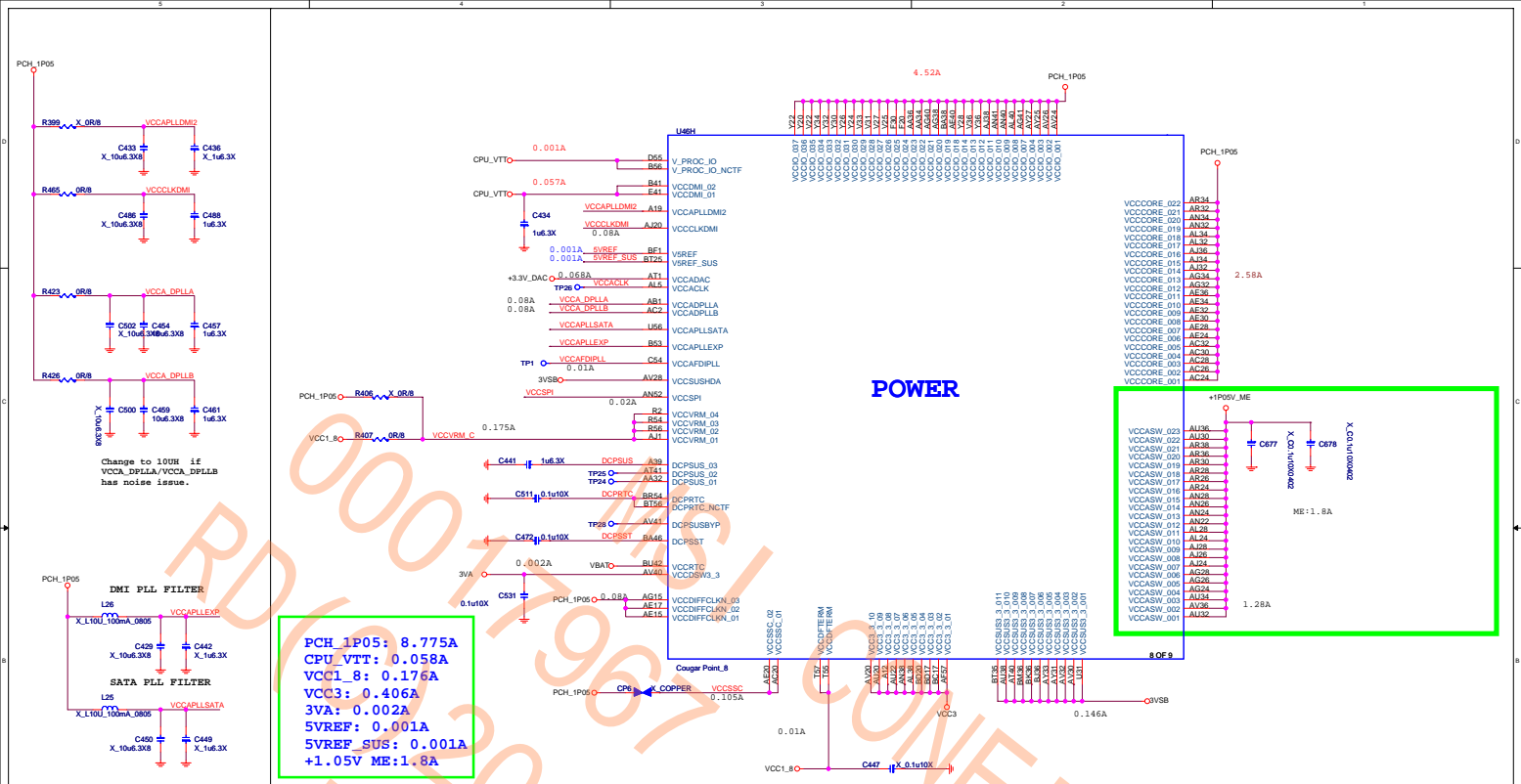
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AV103	VSS_373	VSS_473
AV104	VSS_374	VSS_474
AV105	VSS_375	VSS_475
AV106	VSS_376	VSS_476
AV107	VSS_377	VSS_477
AV108	VSS_378	VSS_478
AV109	VSS_379	VSS_479
AV110	VSS_380	VSS_480
AV111	VSS_381	VSS_481
AV112	VSS_382	VSS_482
AV113	VSS_383	VSS_483
AV114	VSS_384	VSS_484
AV115	VSS_385	VSS_485
AV116	VSS_386	VSS_486
AV117	VSS_387	VSS_487
AV118	VSS_388	VSS_488
AV119	VSS_389	VSS_489
AV120	VSS_390	VSS_490
AV121	VSS_391	VSS_491
AV122	VSS_392	VSS_492
AV123	VSS_393	VSS_493
AV124	VSS_394	VSS_494
AV125	VSS_395	VSS_495
AV126	VSS_396	VSS_496
AV127	VSS_397	VSS_497
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AV246	VSS_516	VSS_616
AV247	VSS_517	VSS_617
AV248	VSS_518	VSS_618
AV249	VSS_519	VSS_619
AV250	VSS_520	VSS_620
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AV252	VSS_522	VSS_622
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AV258	VSS_528	VSS_628
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AV260	VSS_530	VSS_630
AV261	VSS_531	VSS_631
AV262	VSS_532	VSS_632
AV263	VSS_533	VSS_633
AV264	VSS_534	VSS_634
AV265	VSS_535	VSS_635
AV266	VSS_536	VSS_636
AV267	VSS_537	VSS_637
AV268	VSS_538	VSS_638
AV269	VSS_539	VSS_639
AV270	VSS_540	VSS_640
AV271	VSS_541	VSS_641
AV272	VSS_542	VSS_642
AV273	VSS_543	VSS_643
AV274	VSS_544	VSS_644
AV275	VSS_545	VSS_645
AV276	VSS_546	VSS_646
AV277	VSS_547	VSS_647
AV278	VSS_548	VSS_648
AV279	VSS_549	VSS_649
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AV281	VSS_551	VSS_651
AV282	VSS_552	VSS_652
AV		

DDR3 DIMM_A0



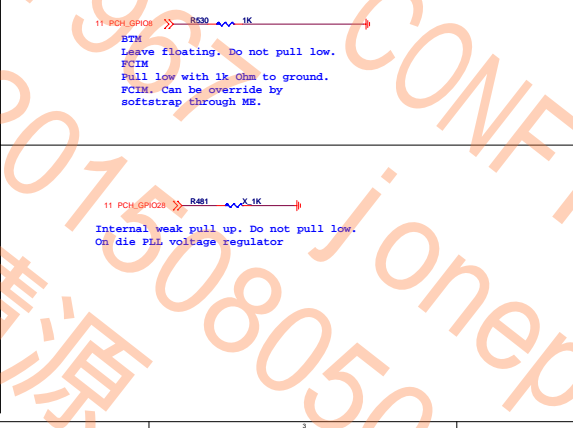
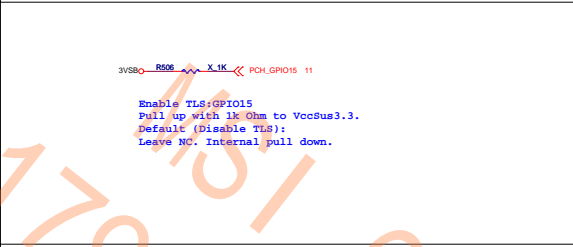
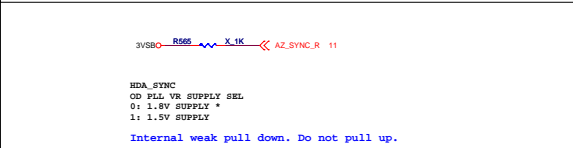
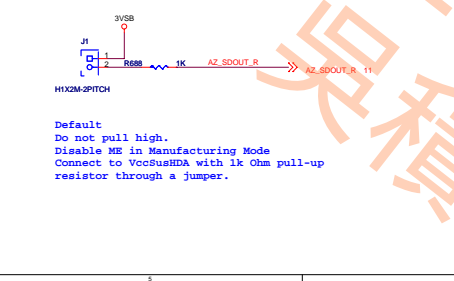
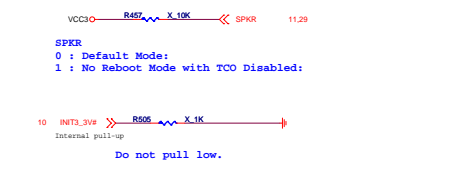


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MS-7758		
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PCH Straps



Since Pin has strap functionality that requires internal pull-down to be sampled at rising PWR0K, following guidelines are required to be followed:

a) When Used as SATA2GP/SATA3GP for Mechanical Presence detect - Use a weak external pull-up (150K-200K ohms) to Vcc3.3 OR use 10K external pull-up that is enabled only after PLTRST# de-assertion.

b) When Used as GP Input (Pin HW default) Ensure GPI is not driven high during strap sampling window

When Unused as GPIO or SATA[x]GP Use 8.2K-10K pull-down to ground.

Since Pin has strap functionality that requires internal pull-down to be sampled at rising PWR0K, following guidelines are required to be followed:

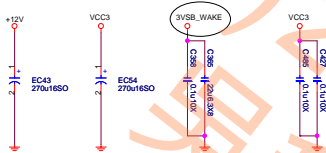
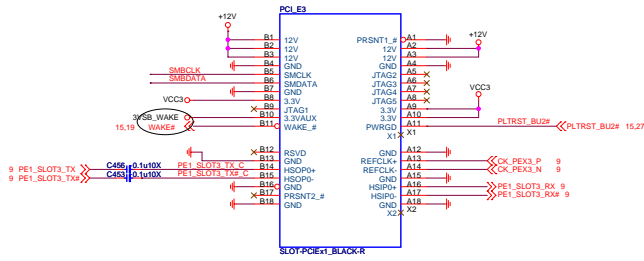
a) When Used as SATA2GP/SATA3GP for Mechanical Presence detect - Use a weak external pull-up (150K-200K ohms) to Vcc3.3 OR use 10K external pull-up that is enabled only after PLTRST# de-assertion.

b) When Used as GP Input (Pin HW default) Ensure GPI is not driven high during strap sampling window

When Unused as GPIO or SATA[x]GP Use 8.2K-10K pull-down to ground.

MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	PPT Strap	4.0
Date: Friday, June 15, 2012	Sheet 14	of 44

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RMA 工程師課 (00011601)



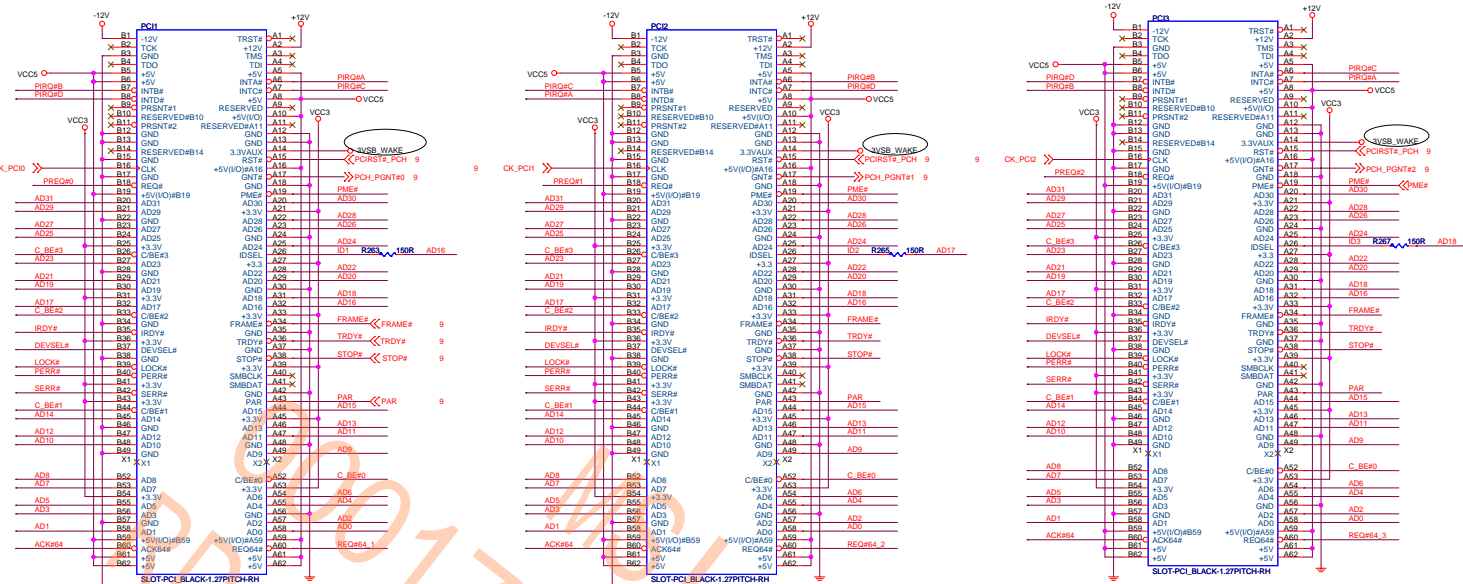
MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	PCI-E3(X1) & PCI-E4(X4) Slots	4.0
Date: Friday, June 15, 2012		Sheet 16 of 44

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~~MSI CONFIDENTIAL~~
00017967 jonepei (裴亮樂)
RD(C)2015080501 RMA工程課
吳積源 (00011601)



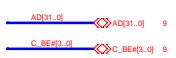
MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	ASM1083 FCI B/L	4.0
Date:	Friday, June 08, 2012	Sheet 17 of 44



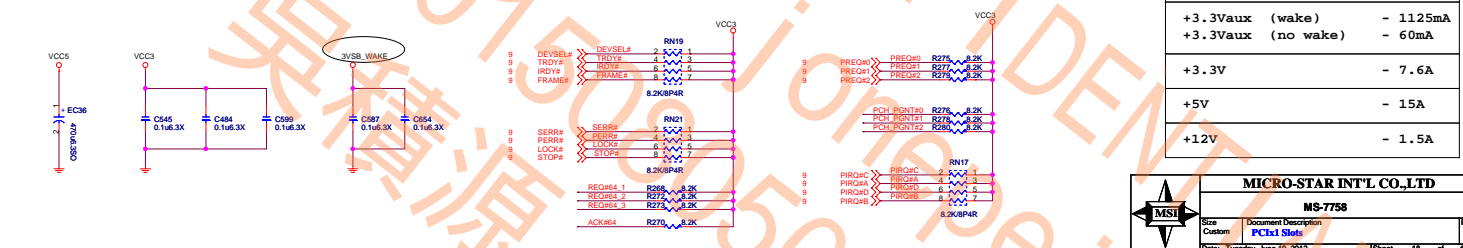
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

IDSEL = AD17
MASTER = PREQ#1
PIRQ#B

IDSEL = AD18
MASTER = PREQ#2
PIRQ#C



PCI PULL-UP / DOWN RESISTORS



PCI slot (X3)	
+3.3Vaux (wake)	- 1125mA
+3.3Vaux (no wake)	- 60mA
+3.3V	- 7.6A
+5V	- 1.5A
+1.2V	- 1.5A

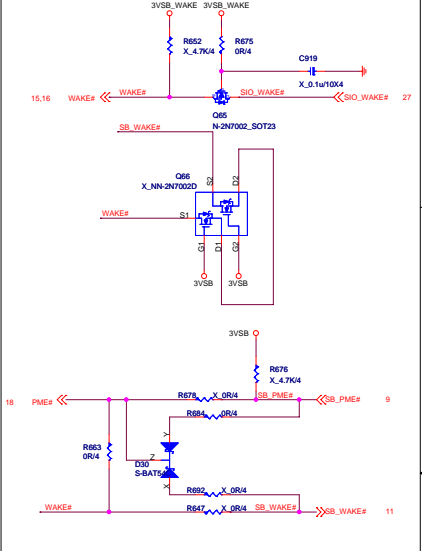
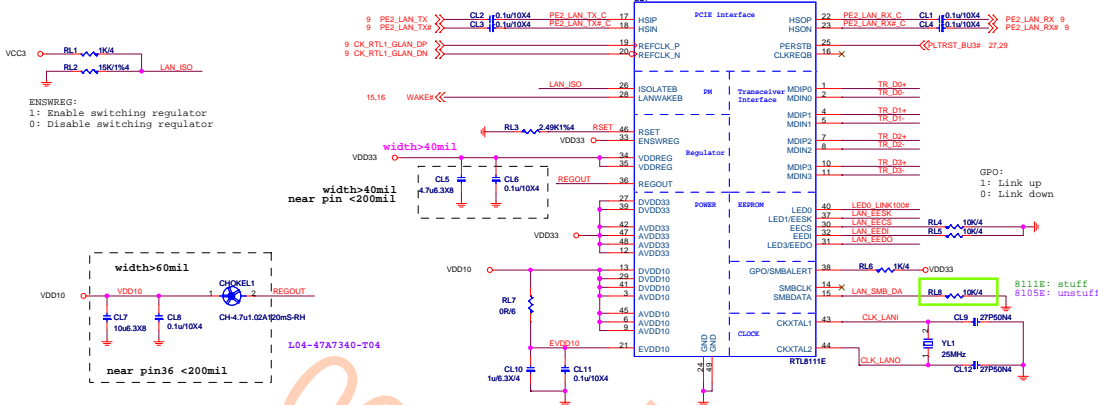
MICRO-STAR INT'L CO.,LTD

MS-7758

Size	Document Description	Rev
Custom	PCIE1 Slots	4.0
Date: Tuesday, June 19, 2012		Sheet 18 of 44

RTL8111E Giga LAN

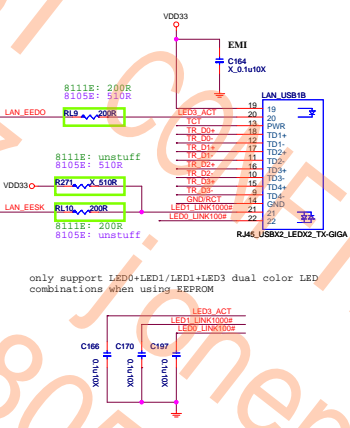
LAN/PCIE/PCI Wake Up CTRL Circuit



8111E POWER Consumption

Mode	3.3V	mW
10 M Idle/TxRx	12/66	40/218
100 M Idle/TxRx	31/44	102/145
Giga Idle/TxRx	135/163	452/538
ALDPS	4	13

LAN Connector



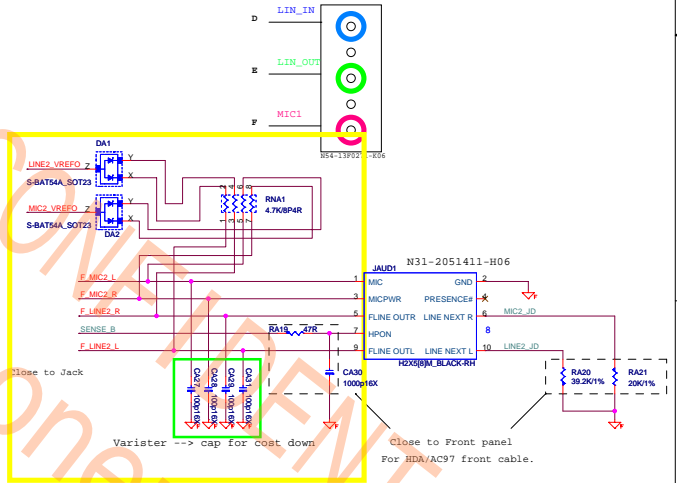
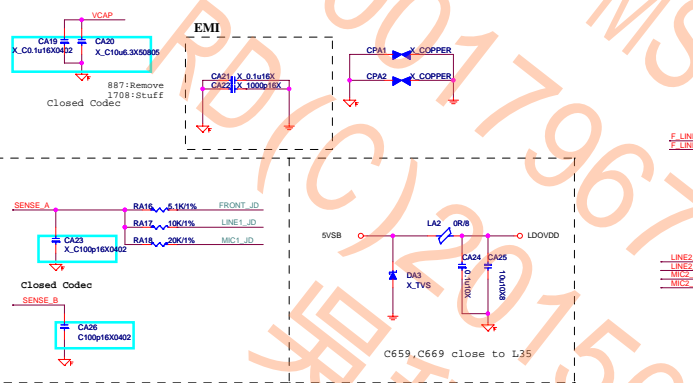
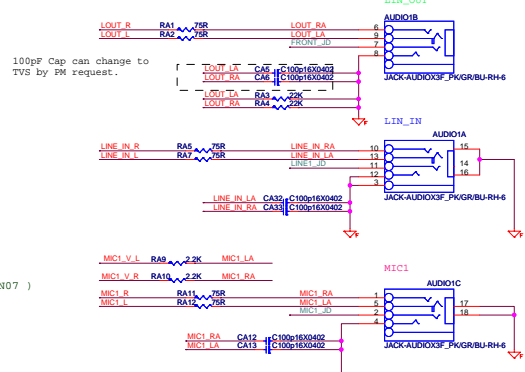
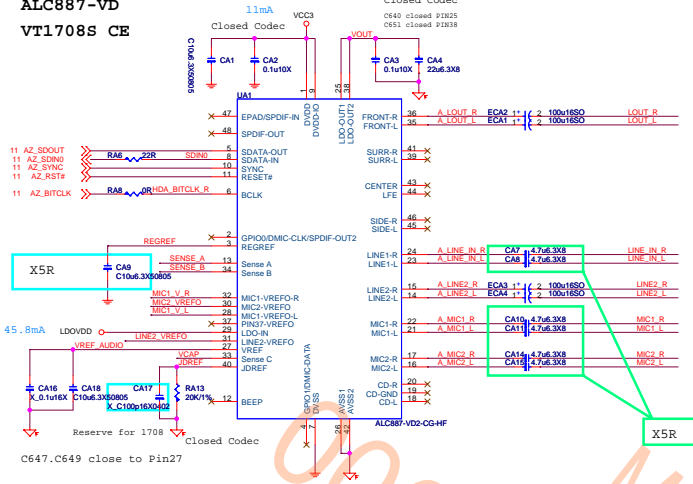
Giga-Lan	10/100-Lan
MS8-22F0731	MS8-22F0771
Link Yellow	Link Yellow
Active Blinking	Active Blinking
100 Orange	100 Green
100 Green	100 None
10 None	10 None
19	19
20	20
21	21
22	22

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Size	Document Description	Rev
Custom	LAN-RTL8111E/8105E	4.0
Date: Wednesday, June 27, 2012		Sheet 19 of 44

ALC887-VD
VT1708S CE

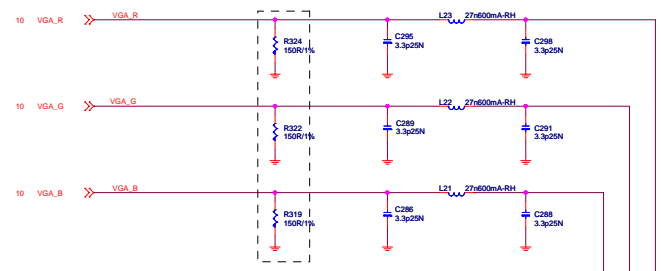
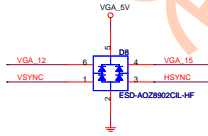
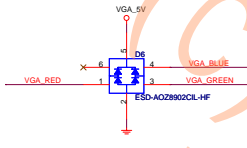
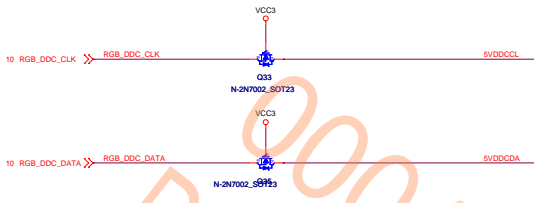
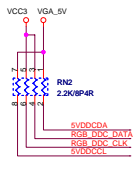


MICRO-STAR INT'L CO., LTD	
MS-7758	
Size	Document Description
Custom	Audio Codec ALC892/887
Date: Monday, June 25, 2012	Sheet 20 of 44

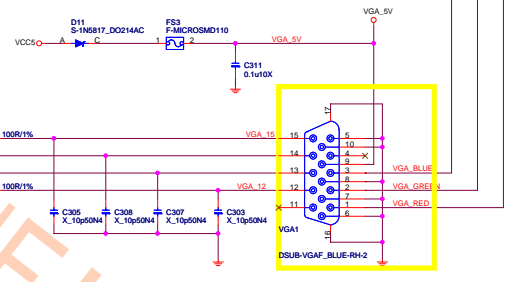
D-Sub

VGA: resolution of 2048x1536 pixels with 32-bit color at 75 Hz (4:3 QXGA)

Level shift



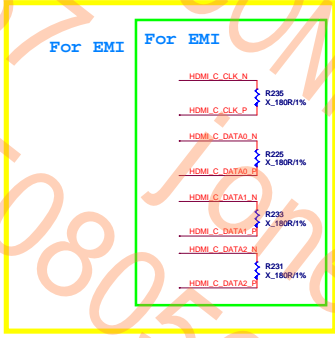
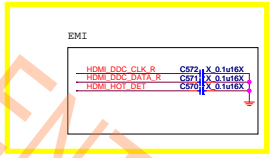
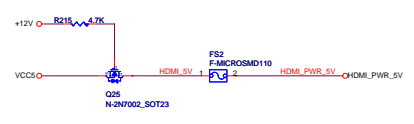
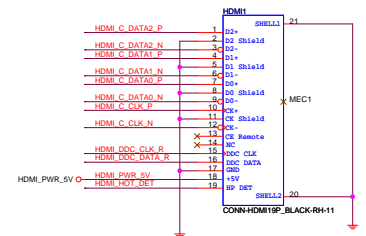
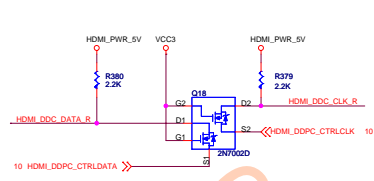
PLACE CLOSE TO VGA CONNECTOR, WITHIN 750 MIL OF PIN



MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	VGA Connector	4.0
Date	Monday, June 25, 2012	Sheet 21 of 44

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 (00011601)

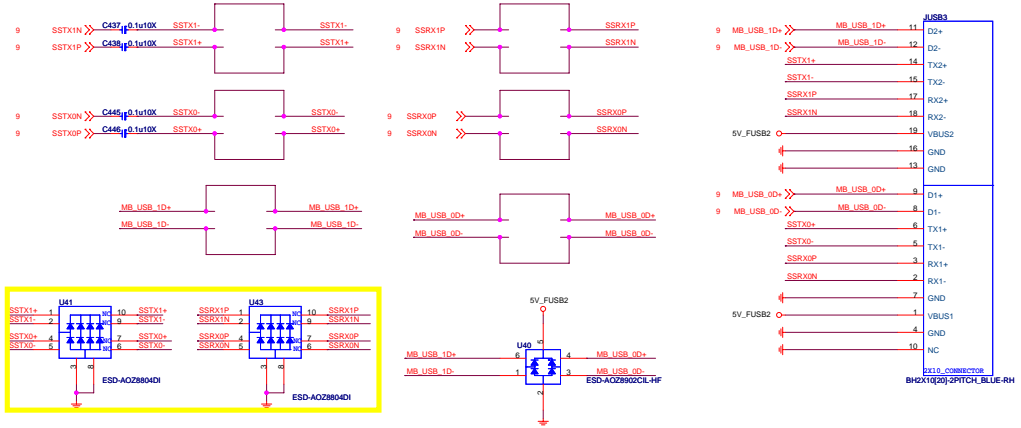
10 HDMI_DDP_C_CLK_P	HDMI_DDP_C_CLK_P	C140	0.1u10X	HDMI_C_CLK_P	R545	680R
10 HDMI_DDP_C_CLK_N	HDMI_DDP_C_CLK_N	C142	0.1u10X	HDMI_C_CLK_N	R547	680R
10 HDMI_DDP_T2_P	HDMI_DDP_T2_P	C134	0.1u10X	HDMI_C_DATA2_N	R557	680R
10 HDMI_DDP_T2_N	HDMI_DDP_T2_N	C136	0.1u10X	HDMI_C_DATA2_P	R559	680R
10 HDMI_DDP_T1_P	HDMI_DDP_T1_P	C138	0.1u10X	HDMI_C_DATA1_N	R561	680R
10 HDMI_DDP_T1_N	HDMI_DDP_T1_N	C140	0.1u10X	HDMI_C_DATA1_P	R563	680R
10 HDMI_DDP_T0_P	HDMI_DDP_T0_P	C142	0.1u10X	HDMI_C_DATA0_N	R565	680R
10 HDMI_DDP_T0_N	HDMI_DDP_T0_N	C144	0.1u10X	HDMI_C_DATA0_P	R567	680R



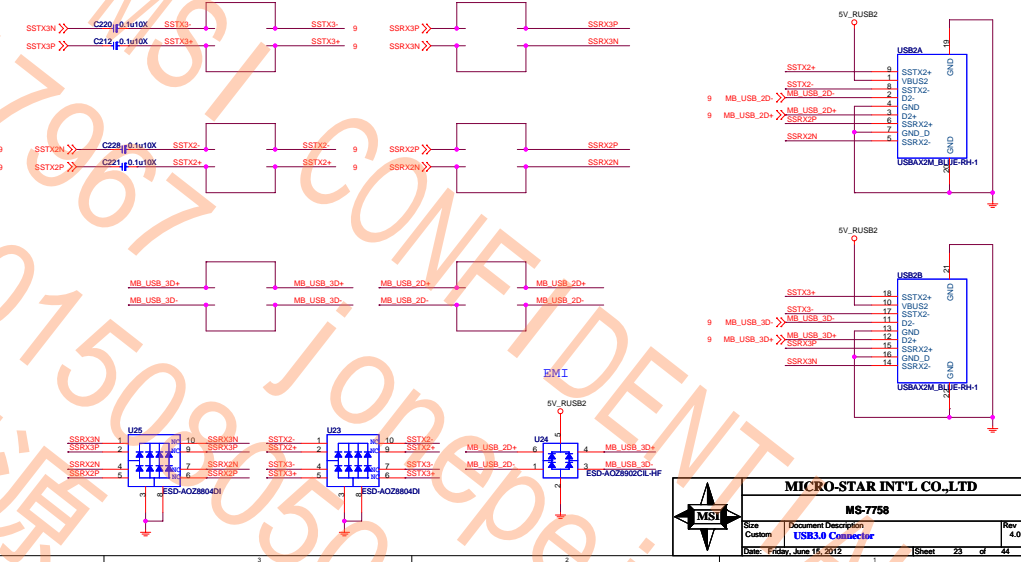
MICRO-STAR INT'L CO.,LTD	
MS-7758	
Size	Document Description
Custom	HDMI Connector
Date: Friday, June 15, 2012	Sheet 22 of 44

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RD(C)201509
吳積源
MSI CONFIDENTIAL
0501 Jonepei (裴亮樂)
RMA 工程師課
(00011601)



MICRO-STAR INT'L CO.,LTD	
MS-7758	
Size: Custom	Document Description: USB3.0 Connector
Date: Friday, June 15, 2012	Sheet: 23 of 44

MODE	S5	S0	S3
S3P5_Gate#	1	1	1
S0P5_Gate#	1	1	0

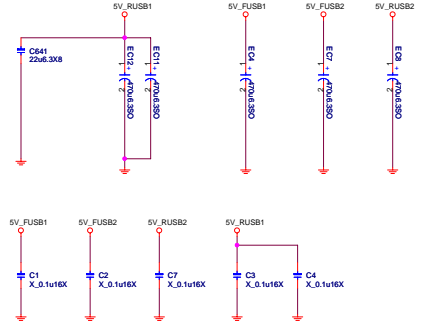
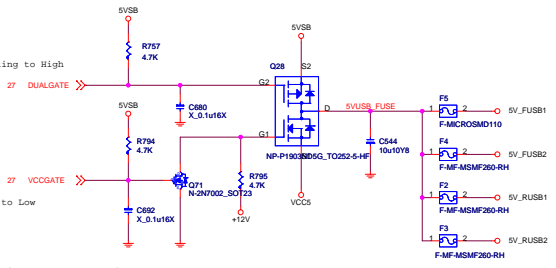
When PS2 in S5 not support wake , S3P5_Gate# in S5 must setting to High

MODE	S5	S0	S3
S3P5_Gate#	0	1	1
S0P5_Gate#	1	1	0

When PS2 in S5 support wake , S3P5_Gate# in S5 must setting to Low

*In S5# (S3P5_Gate # pin status is Tri-state, and can be programmed Low level.

*S3P5_Gate# and S0P5_Gate# can't setting to low together, avoid leakage voltage issue

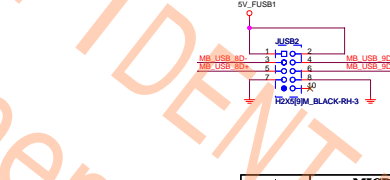
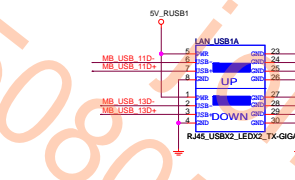
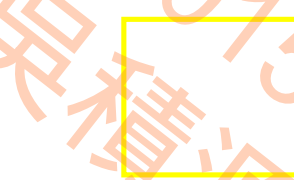
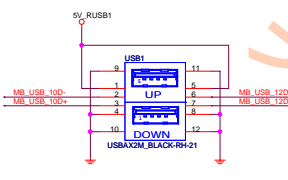
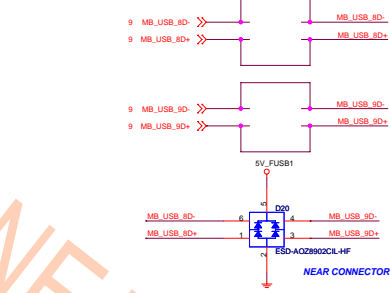
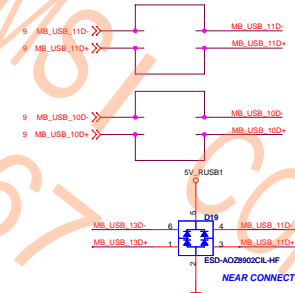
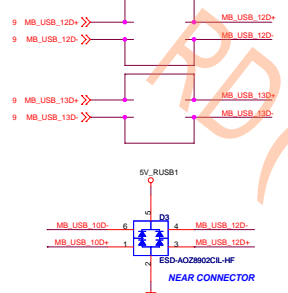


REAR USB PORT 12,13 (With LAN)

REAR USB PORT 8,9 (With HDMI)

FRONT USB PORT 10,11(With PS2)

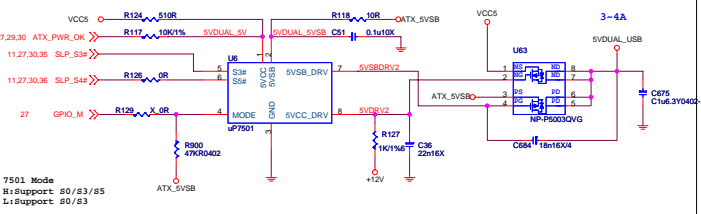
FRONT USB PORT 6,7



MICRO-STAR INT'L CO.,LTD	
MS-7758	
Size	Document Description
Custom	Rear I/O & USB2.0 Connector
Date: Saturday, July 07, 2012	Rev: 4.0
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 (00011601) RMA 工程師 (裴亮樂)

SVDUAL_USB

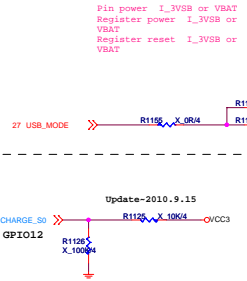


7501 Mode
 B: Support S0/S3/S5
 I: Support S0/S3

SIO GPIO03 Pin51 (I_VSB3V)

USB_CHARGE: (OD)
 0: Don't support USB charge and resume.
 1: Support USB charge and resume.

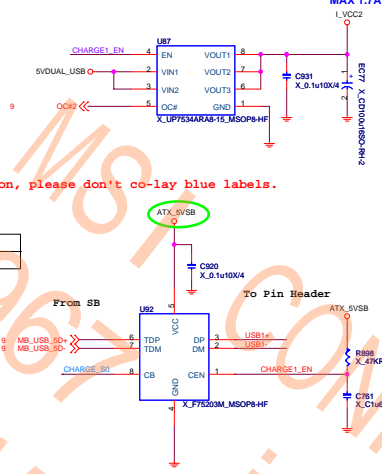
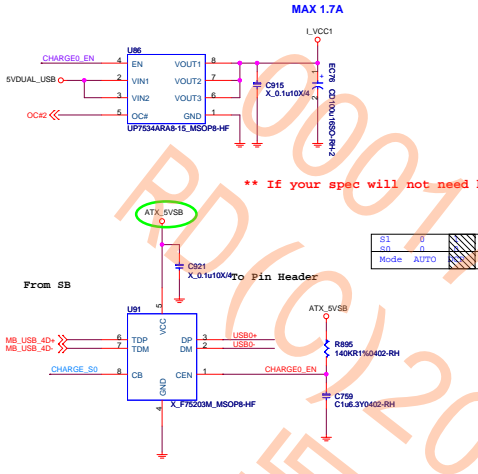
Power plug in , H/W default support USB charge.



Update-2010.9.15
 Pin power I_3VSB
 Register power I_3VSB
 Register reset I_3VSB

USB POWER PORT 0 For USB Charging

USB POWER PORT 1 For USB Charging

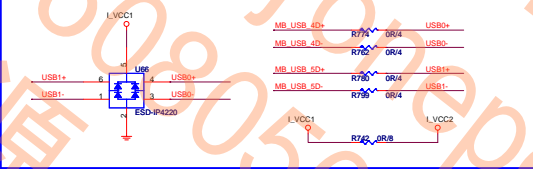


** If your spec will not need bom option, please don't co-layer blue labels.

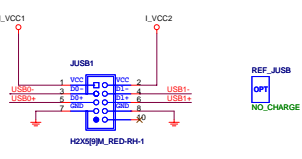
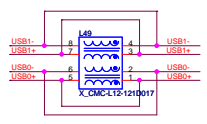
S1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Mode	AUTO																									

A type
 2.70V< D+ < 3.1 V
 1.85V< D- < 2.1V
 For i-pad / i-Phone 4G charges current up to 1.6A.

COLAY remove USB charger ic



FRONT USB PORT 0,1

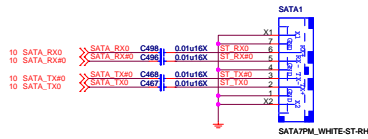


Please name the pin header JUSB1 and use SB USB0_1 link for charger port.

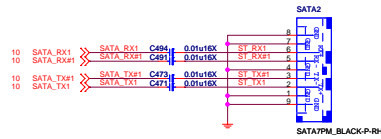
F15USB14550 has internal EDS diode.

Title		USB FULL CHARGE
Size	Document Number	Rev
Custom	MAS-7758	4.0
Date:	Thursday, June 28, 2012	Sheet 25 of 44

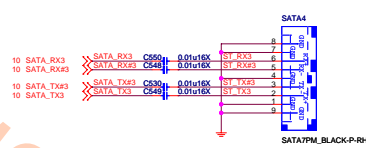
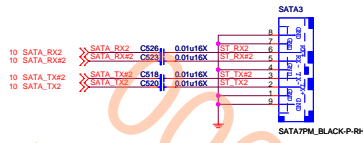
SATA 6G PORT 0
3.0 white



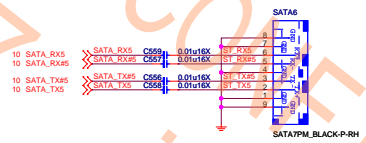
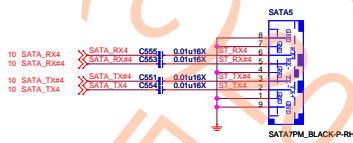
SATA 3G PORT 2



SATA 3G PORT 3,4

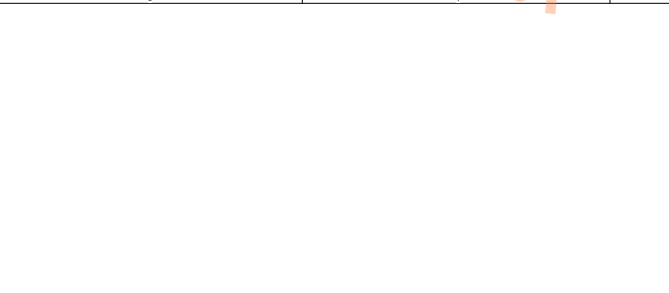
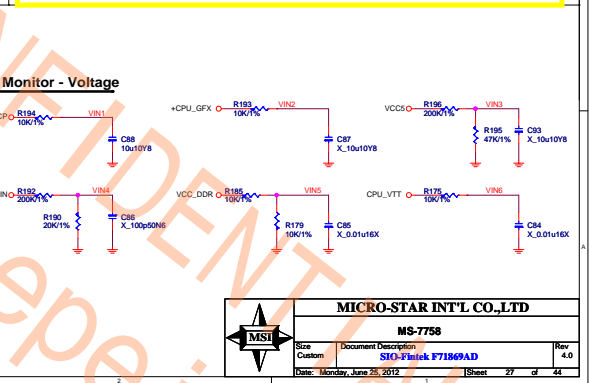
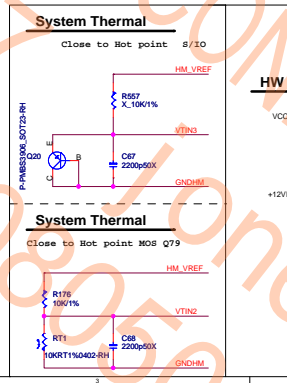
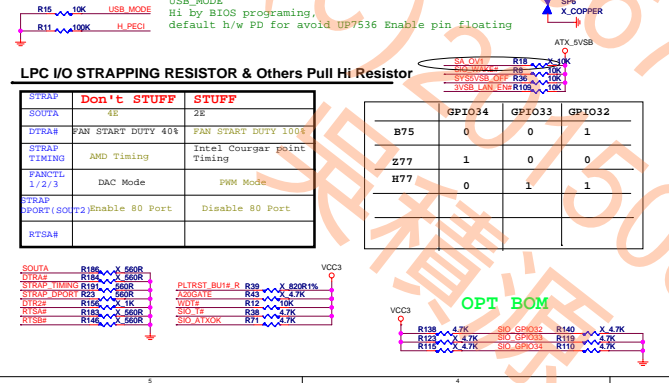
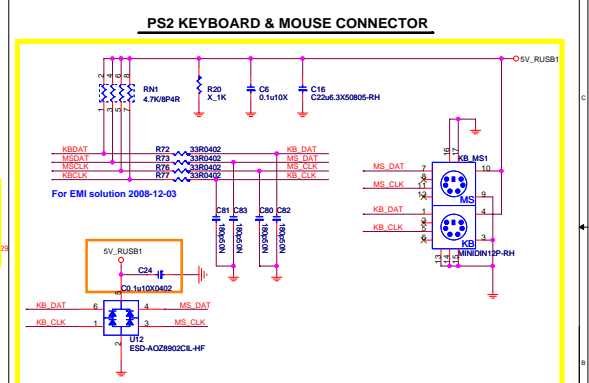
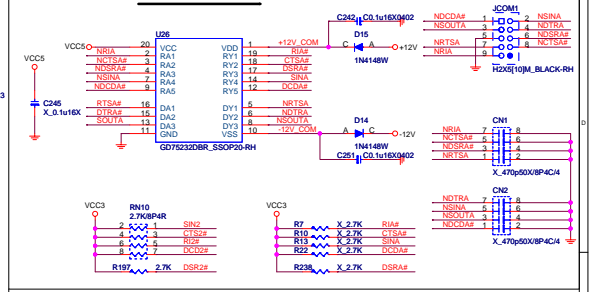
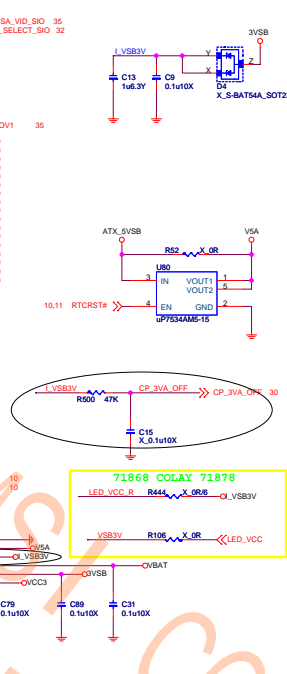
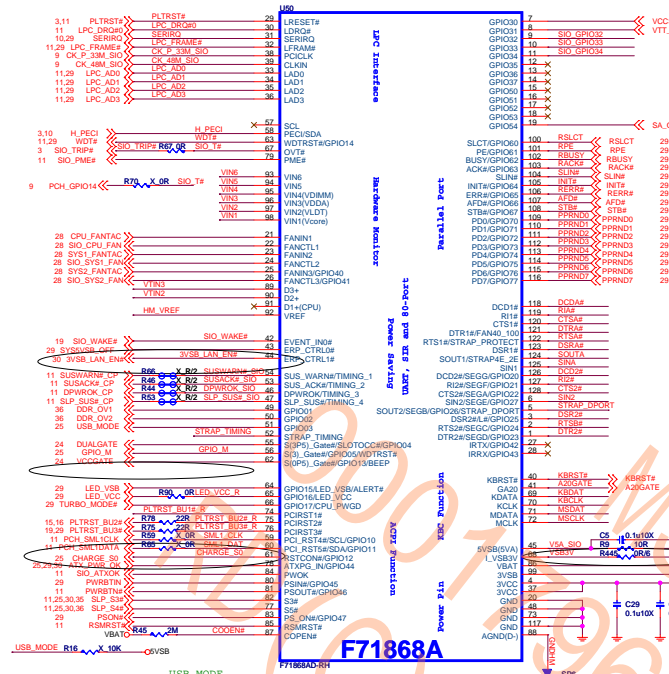


SATA 3G PORT 5,6



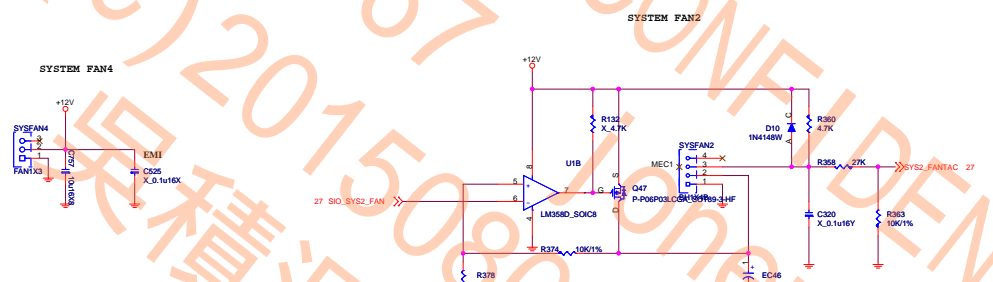
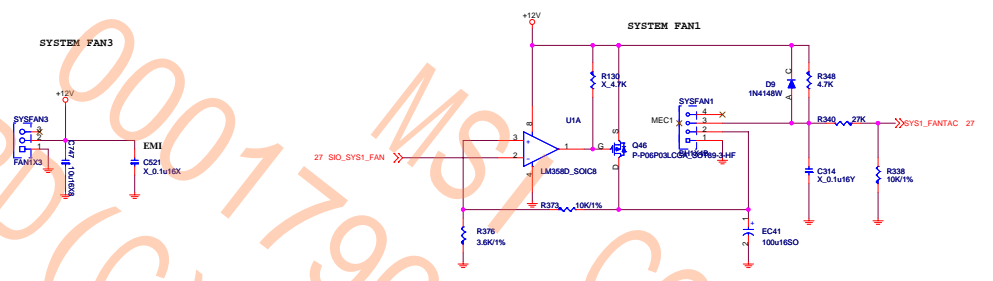
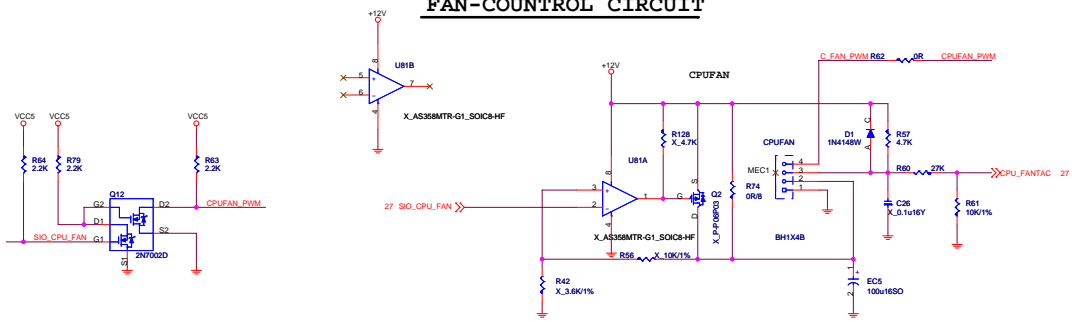
MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	SATA Connector	4.0
Date: Monday, June 25, 2012		Sheet 28 of 44

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 (00011601)



MICRO-STAR INT'L CO.,LTD			
MS-7758			
Size	Document Description	Rev	
Custom	SIO-Funk F71869AD	4.0	
Date: Monday, June 25, 2012		Sheet	27 of 44

FAN-COUNTROL CIRCUIT



MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	FAN Control	4.0
Date: Friday, June 15, 2012		Sheet 28 of 44

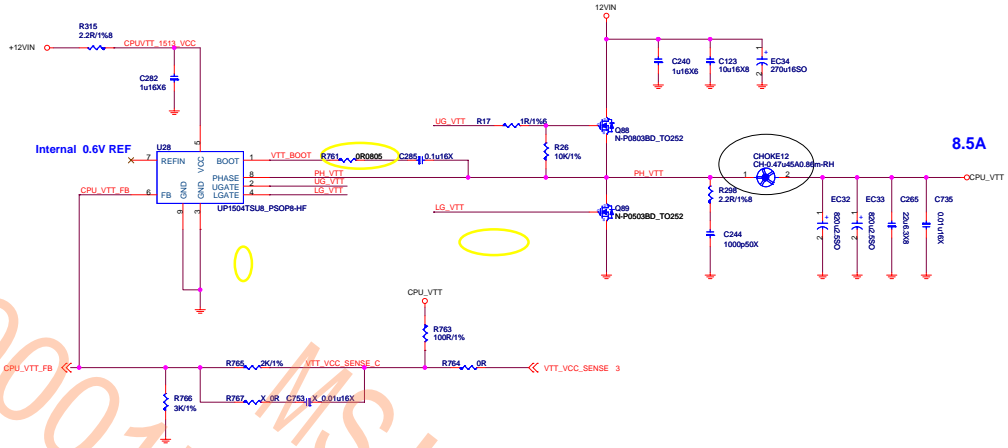
00017967 MS-7758 CONFIDENTIAL
 RD(C) 2015080501 (裴亮樂)
 吳積源 (00011601) RMA 工程師

CPU_VTT:1.05/1.00 MAX 17.3A

CPU VTT 8.5A SA Core =8.8A

8.5A FOR CPU

Iripple=1.92(vtt)+1.88(sa)
5*1=5A>3.8A

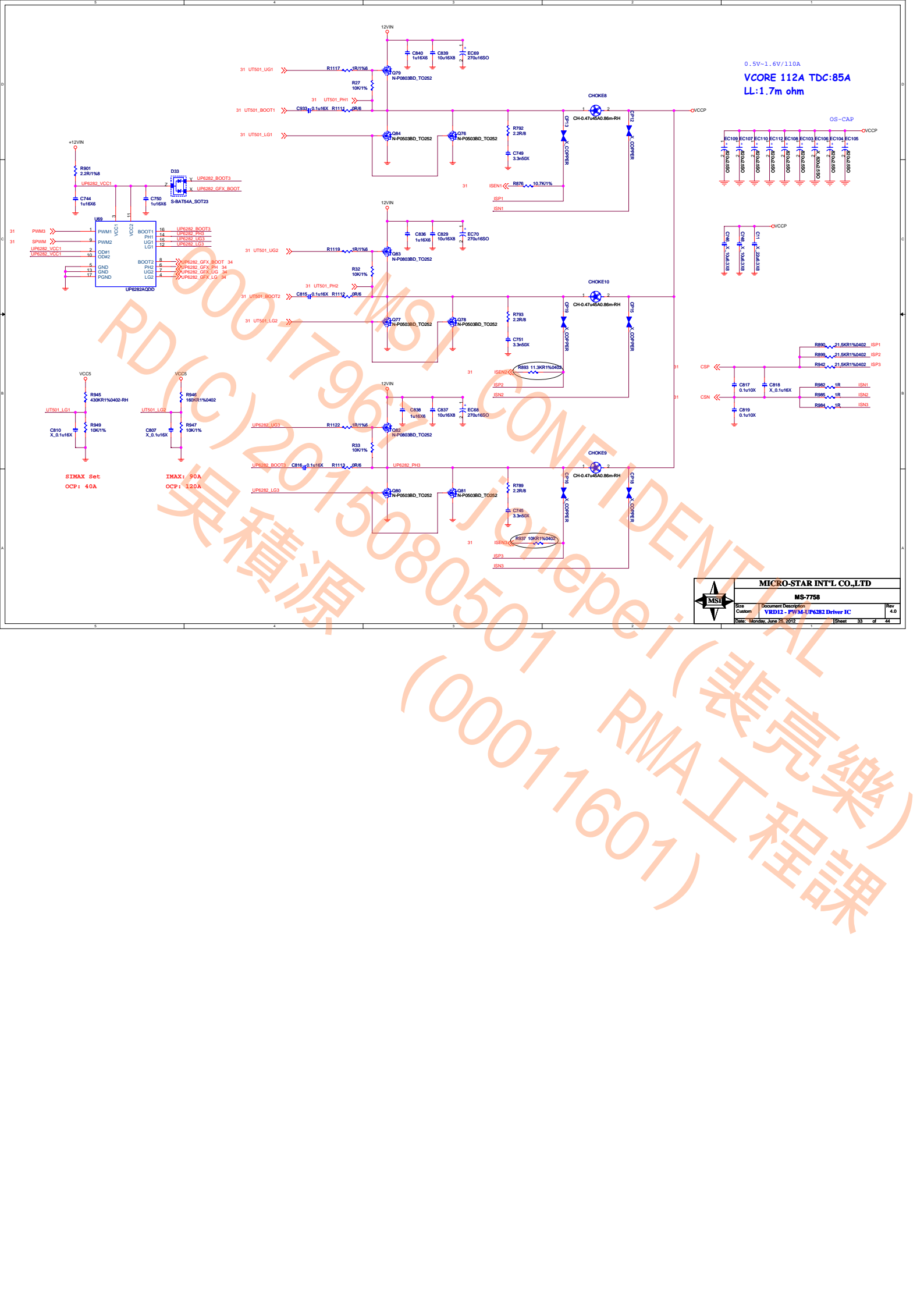


VTT_SELECT	
Low	1.0V
High	1.05V

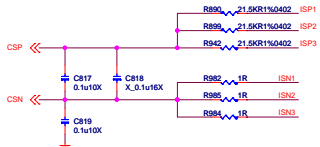
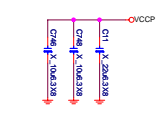
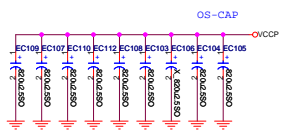
VTT_SELECT Sable	
Low	1.05V
High	1.0V



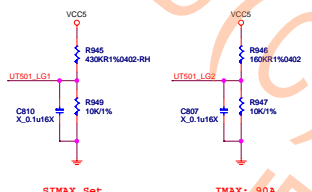
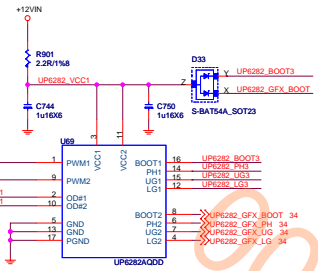
MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	VTT POWER- nP1513-1Phase MOS	4.0
Date: Monday, June 25, 2012		Sheet 32 of 44



0.5V-1.6V/110A
VCORE 112A TDC:85A
LL:1.7m ohm

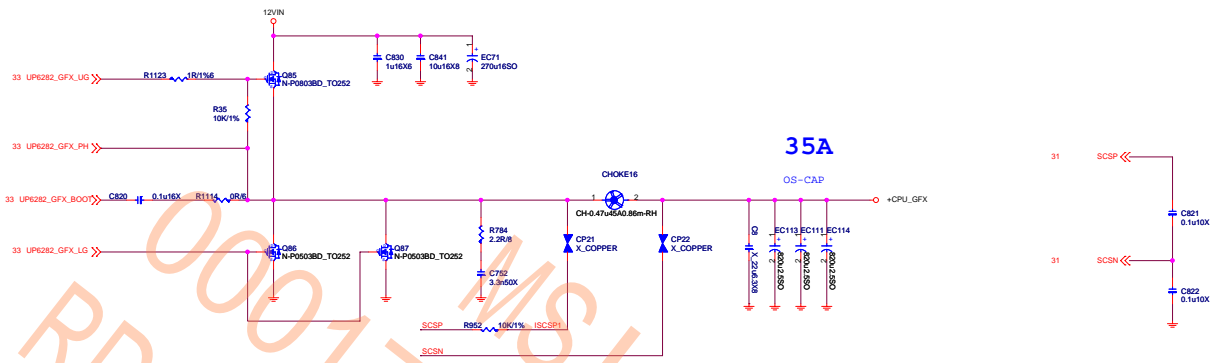


MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	VRD12 - PWM-UP6282 Driver IC	4.0
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SIMAX Set
OCP: 40A

IMAX: 90A
OCP: 120A



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(00011601)

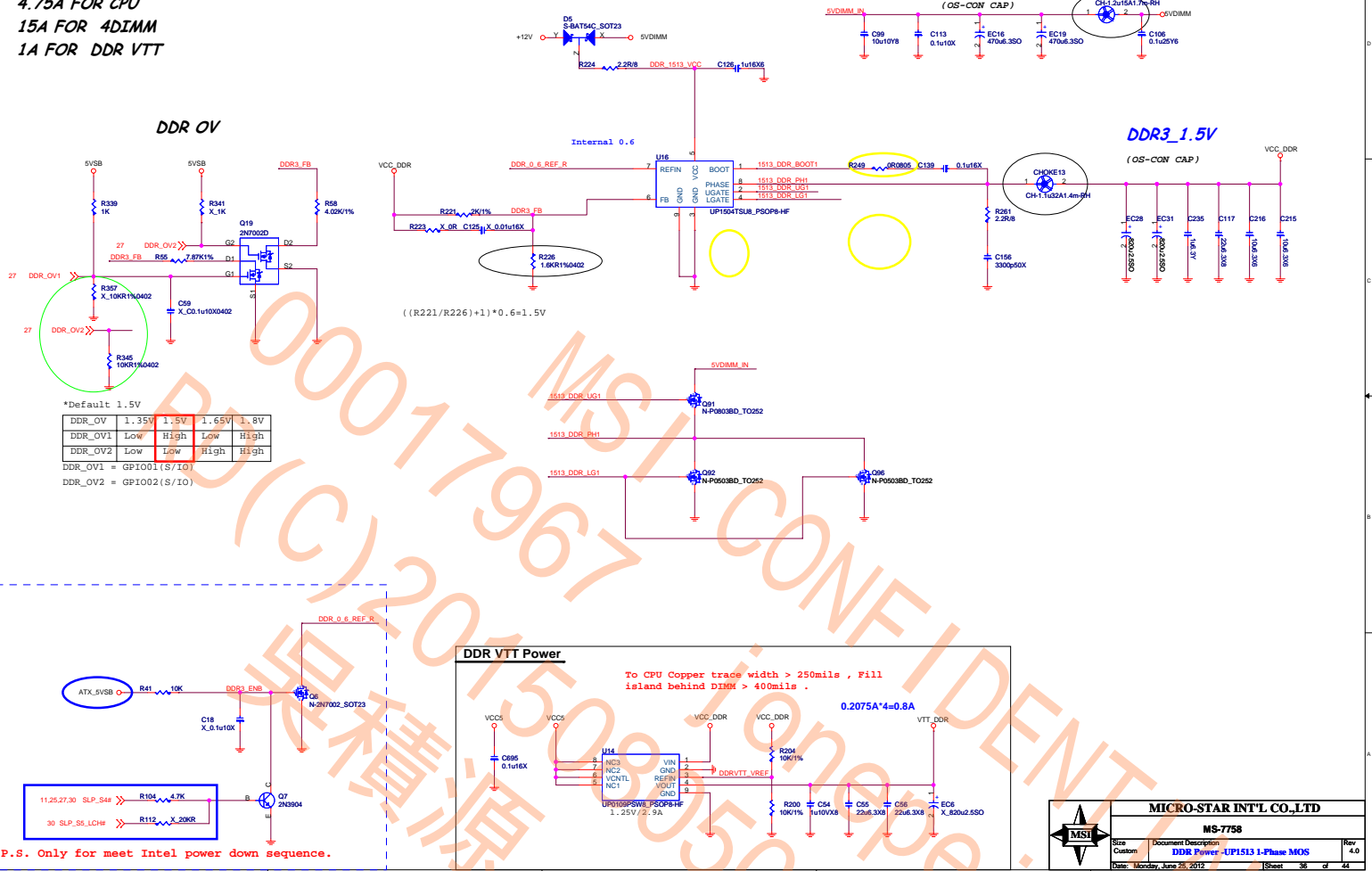
MICRO-STAR INT'L CO.,LTD		
MS-7758		
Size	Document Description	Rev
Custom	VRD12-CPU 1-Phase MOS	4.0
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DDR Power:1.5V

$DDR3\ 1.5V\ 4.75A+15A+1A=20.75A$

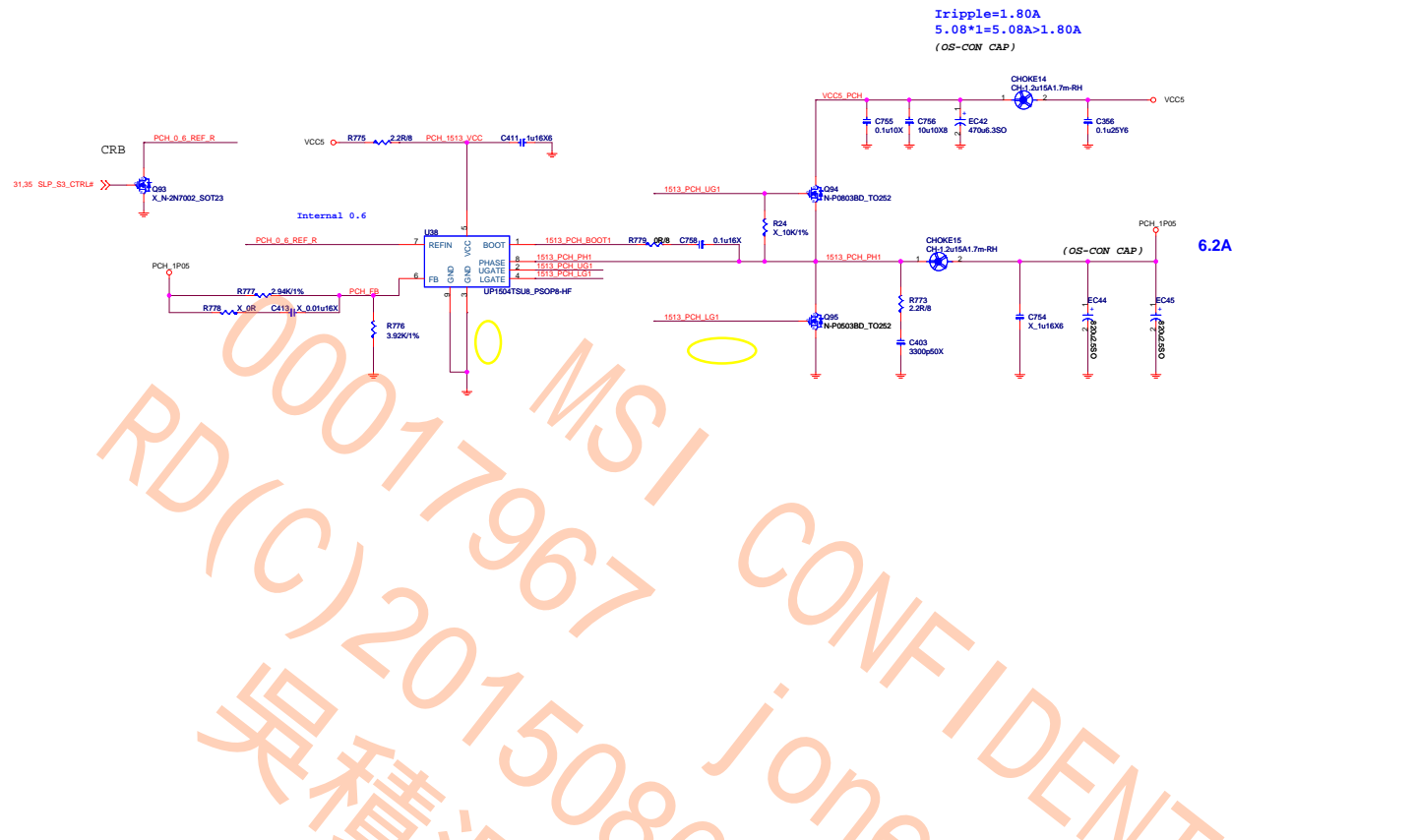
4.75A FOR CPU
15A FOR 4DIMM
1A FOR DDR VTT

$Ripple=8A$
 $4.7 \times 2 \times 1 = 9.4A > 8A$



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Size	Document Description	Rev
Custom	DDR Power-UP1513 1-Phase MOS	4.0
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PCH Power:1.05V
PCH Core 6.2A



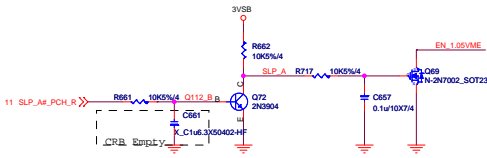
Tripple=1.80A
 5.08*1=5.08A>1.80A
 (OS-CON CAP)

6.2A

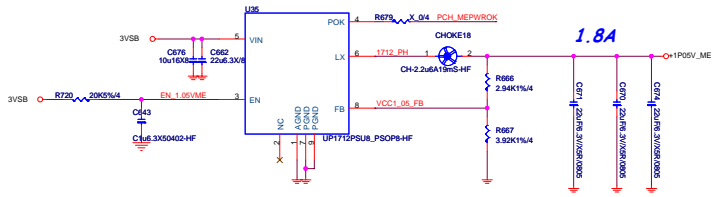
00017967 MSI CONFIDENTIAL
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 (00011601)

MICRO-STAR INT'L CO.,LTD		
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Size	Document Description	Rev
Custom	PCH Power - nP1513 1-Phase MOS	4.0
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SLP_A

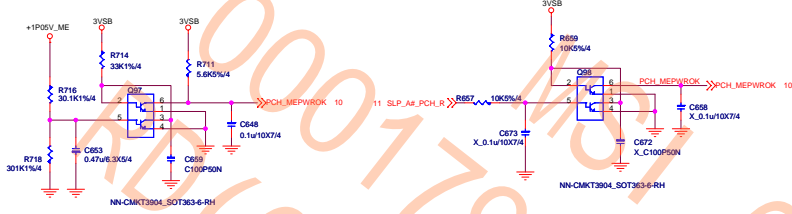


ME Power Control

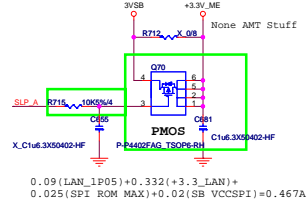


+1.05V_ME(VCCIO_ME)

PCH_MEPWROK



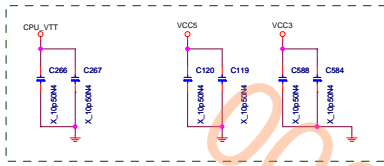
+3.3V_ME



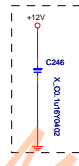
$$0.09 (LAN_IP05) + 0.332 (+3.3_LAN) + 0.025 (SPI_ROM_M2X) + 0.02 (SB_VCCSPI) = 0.467A$$

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Custom	ME Power - UPI1712	4.0
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EMI:cap. for signal return path



EMI



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			MS-7758	
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Custom	EMI CAP			4.0
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