MS-7459 VER:1.0

CPU:

AMD M2 Athlon 64/Athlon 64 FX AM2R2

System Chipset:

AMD/ATI RS780G

AMD/ATI SB700

On Board Chipset:

FINTEK Super I/O -- F71882
LAN -- RTL8111DL
HD Codec -- ALC888S-VC2
BIOS -- SPI ROM 8M

Main Memory:

DDR SO-DIMM X 2 (Max 4GB)

Expansion Slots:

MINI-PCI-E X 1 *2
IDE X 1

Clock Generator:

Controller--RTM880N-793-VB-GR

PWM:

ISL6323CR

Micro Star Restricted Secret		
Title: Cover Sheet		Rev 1.0
Document Number: MS-7459		
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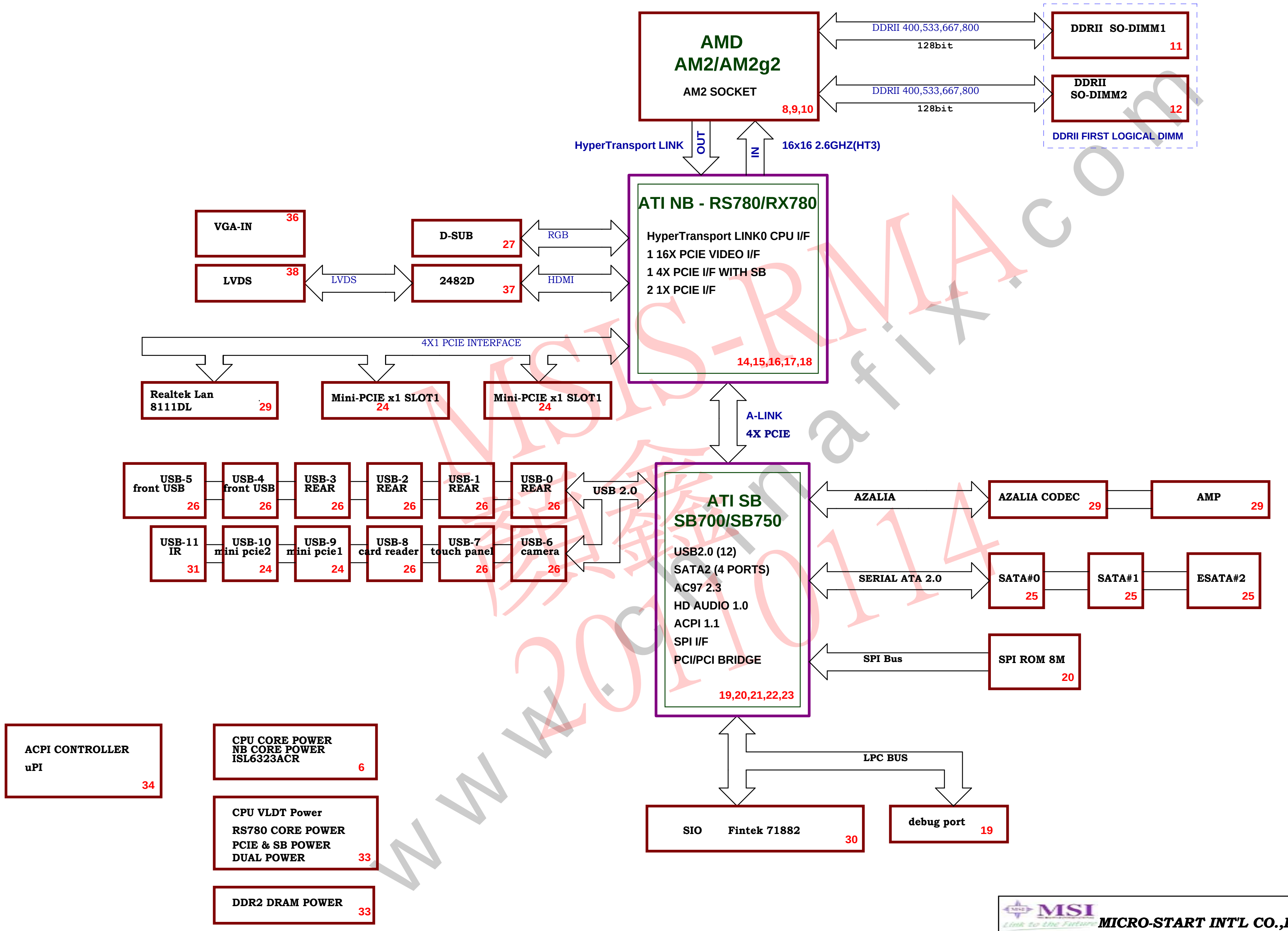
Project RS780/RX780BLOCK DIAGRAM



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Title: BLOCK Diagram		
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SB700/750 GPIO Config

GPIO Name	Type	Function description	Pin	Page
PCICLK5/GPIO41	3.3V	PCI_CLK5	T3	19
REQ3#/GPIO70		PREQ#3	AE6	19
REQ4#/GPIO71		PREQ#4	AB6	19
GNT3#/GPIO72		Unused	AC6	19
GNT4#/GPIO73		Unused	AE5	19
INTE#/GPIO33		PCI_INTA#	AD3	19
INTF#/GPIO33		PCI_INTB#	AC4	19
INTG#/GPIO33		PCI_INTC#	AE2	19
INTH#/GPIO33		PCI_INTD#	AE3	19
LDRQ1#/GNT5#/GPIO68		Unused	AB8	19
BMREQ#/REQ5#/GPIO68		PREQ#5	AD7	19
RI#/EXTEVNT0#		RI#	E2	19
SLP_S2/GPM9#		Unused	H7	19
GA20IN/GEVENT0#		A20GATE	Y15	19
KBRST#/GEVENT1#		KBRST#	W15	19
LPC_PME#/GEVENT3#		LPC_PME#	K4	19
LPC_SMI#/EXTEVNT1#		LPC_SMI3	K24	19
S3_STATE/GEVENT5#		Unused	F1	19
SYS_RESET#/GPM7#		FP_RST#	J2	19
WAKE#/GEVENT8#		WAKE#	H6	19
BLINK/GPM6#		Unused	F2	19
MBALERT#THRMTRIP#/GEVENT2#		SMBALERT#	J6	19
SATA_ISO#/GPIO10		SB_GPIO10	AE18	19
CLK_REQ3#/SATA_IS1#/GPIO6		SB_GPIO6	AD18	19
SMARTVOLT/SATA_IS2/GPIO4		SB_GPIO4	AA19	19
CLK_REQ0#SATA_IS3#/GPIO0		SB_GPIO0	W18	19
CLK_REQ1#/SATA_IS4#/GPIO3		SB_GPIO39	V17	19
CLK_REQ2#/SATA_IS5#/GPIO40		SB_GPIO40	W20	19
SPKR/GPIO2		SPKR	W21	19
SCL0/GPOC0#		SCLK	AA18	19
SDA0/GPOC1#		SDATA	W18	19
SCL1/GPOC2#		SCLK1	K1	19
SDA1/GPOC3#		SDATA1	K2	19
DDC1_SCL/GPIO9		Unused	AA20	19
DDC1_SDA/GPIO8		SPI_WP#	Y18	19
LLB3/GPIO66		LC_SENSE	C1	19
SHUTDOWN#/GPIO5		SB_GPIO5	Y19	21
DDR3_RST#/GEVENT7#		Unused	G5	21
SB_OC6#/IR_TX1/GEVENT6#		OC6#	B9	21
USB_OC5#IR_TX0/GPM5#		OC5#	B8	21
USB_OC4#IO_RX0/GPM4#		OC4#	A8	21
USB_OC3#/IR_RX1/GPM3#		OC3#	A9	21
USB_OC2#/GPM2#		OC2#	E5	21
USB_OC1#/GPM1#		OC1#	F8	21
USB_OC0#/GPM0#		OC0#	E4	21
AZ_SDIN0/GPIO42		SDATA_IN_R	J7	21
AZ_SDIN1/GPIO43		Unused	J8	21
AZ_SDIN2/GPIO44		Unused	L8	21
AZ_SDIN3/GPIO46		Unused	M3	21

SB700/750 GPIO Config

GPIO Name	Type	Function description	Pin	Page
AZ_DOCK_RST#/GPM8#	3.3V	Unused	L5	21
PS2_DAT/EC_GPIO0		Unused	H19	21
PS2_CLK/EC_GPIO1		Unused	H20	21
SPI_CS2#/EC_GPIO2		Unused	H21	21
IDE_RST#/F_RST#/EC_GPO3		Unused	F25	21
PS2KB_DAT/EC_GPIO4		Unused	D22	21
PS2KB_CLK/EC_GPIO5		Unused	E24	21
PS2M_DAT/EC_GPIO6		Unused	E25	21
PS2M_CLK/EC_GPIO7		Unused	D23	21
USBCLK/14M_25M_48M_OSC		USB_48M_CLK	C8	21
KSO_16/EC_GPIO8		Unused	A18	21
KSO_17/EC_GPIO9		Unused	B18	21
EC_PWM0/EC_GPIO10		Unused	F21	21
SCL2/EC_GPIO11		Unused	D21	21
SDA2/EC_GPIO12		Unused	F19	21
SCL3_LV/EC_GPIO13		Unused	E20	21
SDA3_LV/EC_GPIO14		Unused	E21	21
EC_PWM1/EC_GPIO15		Unused	E19	21
EC_PWM2/EC_GPIO16		SB_GP16	D19	21
EC_PWM3/EC_GPIO17		Unused	E18	21
KSI_0/EC_GPIO18		Unused	G20	21
KSI_1/EC_GPIO19		Unused	G21	21
KSI_2/EC_GPIO20		Unused	D25	21
KSI_3/EC_GPIO21		Unused	D24	21
KSI_4/EC_GPIO22		Unused	C25	21
KSI_5/EC_GPIO23		Unused	C24	21
KSI_6/EC_GPIO24		Unused	B25	21
KSI_7/EC_GPIO25		Unused	C23	21
KSO_0/EC_GPIO26		Unused	B24	21
KSO_1/EC_GPIO27		Unused	B23	21
KSO_2/EC_GPIO28		Unused	A23	21
KSO_3/EC_GPIO29		Unused	C22	21
KSO_4/EC_GPIO30		Unused	A22	21
KSO_5/EC_GPIO31		Unused	B22	21
KSO_6/EC_GPIO32		Unused	B21	21
KSO_7/EC_GPIO33		Unused	A21	21
KSO_8/EC_GPIO34		Unused	D20	21
KSO_9/EC_GPIO35		Unused	C20	21
KSO_10/EC_GPIO36		Unused	A20	21
KSO_11/EC_GPIO37		Unused	B20	21
KSO_12/EC_GPIO38		Unused	B19	21
KSO_13/EC_GPIO39		Unused	A19	21
KSO_14/EC_GPIO40		Unused	D18	21
KSO_15/EC_GPIO41		Unused	C18	21
SATA_ACT#/GPIO67		SATA_LED#	W11	21
IDE_D0/GPIO15		Unused	AD24	21
IDE_D1/GPIO16		Unused	AD23	21
IDE_D2/GPIO17		Unused	AE22	21
IDE_D3/GPIO18		Unused	AC22	21

SB700/750 GPIO Config

GPIO Name	Type	Function description	Pin	Page
IDE_D4/GPIO19	3.3V	Unused	AD21	20
IDE_D5/GPIO20		Unused	AE20	
IDE_D6/GPIO21		Unused	AB20	
IDE_D7/GPIO22		Unused	AD19	
IDE_D8/GPIO23		Unused	AE19	
IDE_D9/GPIO24		Unused	AC20	
IDE_D10/GPIO25		Unused	AD20	
IDE_D11/GPIO26		Unused	AE21	
IDE_D12/GPIO27		Unused	AB22	
IDE_D13/GPIO28		Unused	AD22	
IDE_D14/GPIO29		Unused	AE23	
IDE_D15/GPIO30		Unused	AC23	
SPI_DI/GPIO12		SPI_DATAIN	G6	
SPI_DO/GPIO11		SPI_DATAOUT	D2	
SPI_CLK/GPIO47		SPI_CLK	D1	
SPI_HOLD#/GPIO31		SPI_HOLD_L	F4	
SPI_CS#/GPIO32		SPI_CS#	F3	
LAN_RST#/GPIO14		CPU_PRESENT#	U15	
ROM_RST#/GPIO14		Unused	J1	
FANOUT0/GPIO3		Unused	M8	
FANOUT1/GPIO48		COM_GPIO	M5	
FANOUT2/GPIO49		Unused	M7	
FANIN0/GPIO50		Unused	P5	
FANIN1/GPIO51		Unused	P8	
FANIN2/GPIO52		Unused	E8	
TEMPIN0/GPIO61		Unused	B6	
TEMPIN1/GPIO62		Unused	A6	
TEMPIN2/GPIO63		Unused	A5	
TEMPIN3/TALERT#/GPIO64		TALERT3	B5	
VIN0/GPIO53		Unused	A4	
VIN1/GPIO54		Unused	B4	
VIN2/GPIO55		Unused	C4	
VIN3/GPIO56		Unused	D4	
VIN4/GPIO57		Unused	D5	
VIN5/GPIO58		Unused	D6	
VIN6/GPIO59		Unused	A7	
VIN7/GPIO60		Unused	B7	

F71882 GPIO Config

GPIO Name	Type	Function description	Pin	Page
VIDO5/GP27	3.3V	Unused	AD21	20
VIDO4/GP26		Unused	AE20	
VIDO1/GP21/VGP0		Unused	AB20	
PME#/GP54		Unused	AD19	
KRST#/GP62		Unused	AE19	
GA20/JP7		Unused	AC20	
KDAT/GP61		Unused	AD20	
KCLK/GP60		Unused	AE21	
MDAT/GP57		Unused	AB22	
MCLK/GP56		Unused	AD22	
SUSC#/GP53		Unused	AE23	
PSON#/GP42		Unused	AC23	
PANSWH#/GP43		SPI_DATAIN	G6	
PWRON#/GP44		SPI_DATAOUT	D2	
PCIRST3#/GP11		SPI_CLK	D1	
PCIRST2#/GP12		SPI_HOLD_L	F4	
FAN_CTL3/GP36		SPI_CS#	F3	
FAN_TAC3/GP36		CPU_PRESENT#	U15	
FAN_CTL2/GP51		Unused	J1	
FAN_TAC2/GP52		Unused	M8	
FAN_CTL1		COM_GPIO	M5	
FAN_TAC1		Unused	M7	
VID2/GP32		Unused	P5	
VID3/GP33		Unused	P8	
VID3/GP33		Unused	E8	
VID4/GP34		Unused	B6	
VID5/GP35		Unused	A6	

PCI Config.

DEVICE	MCP1 INT Pin	REQ# / GNT#	IDSEL	CLOCK
PCI Slot 1	PCI_INTE# PCI_INTF# PCI_INTG# PCI_INTH#	PREQ#0 PGNT#0	AD21	PCICLK0
PCI Slot 2	PCI_INTF# PCI_INTG# PCI_INTH# PCI_INTE#	PREQ#1 PGNT#1	AD22	PCICLK1
PCI Slot 3	PCI_INTG# PCI_INTH# PCI_INTE# PCI_INTF#	PREQ#2 PGNT#2	AD23	PCICLK3

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Title: GPIO Configuration
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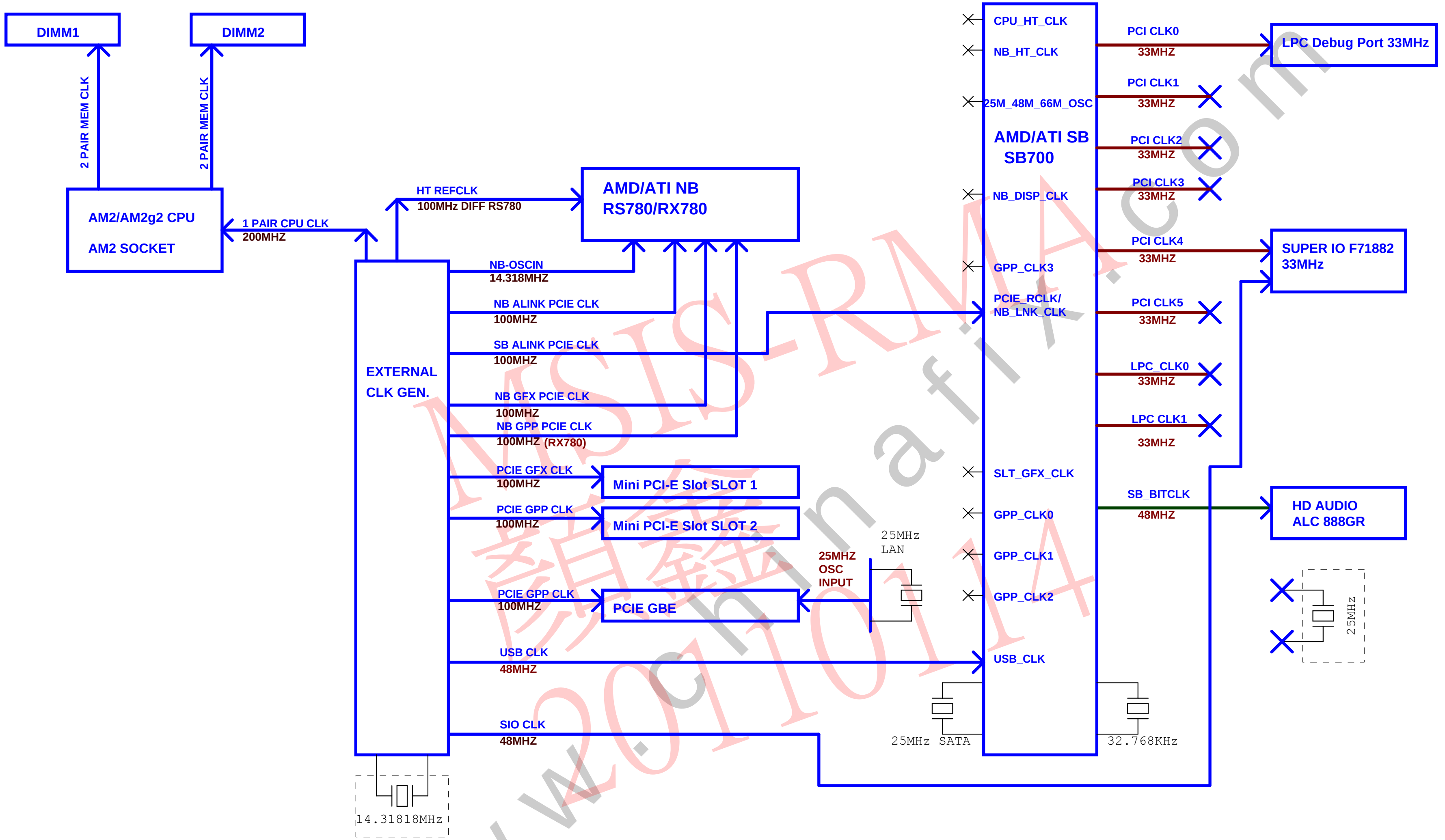

External clock mode
Internal clock mode

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Title	Clock Distribution	
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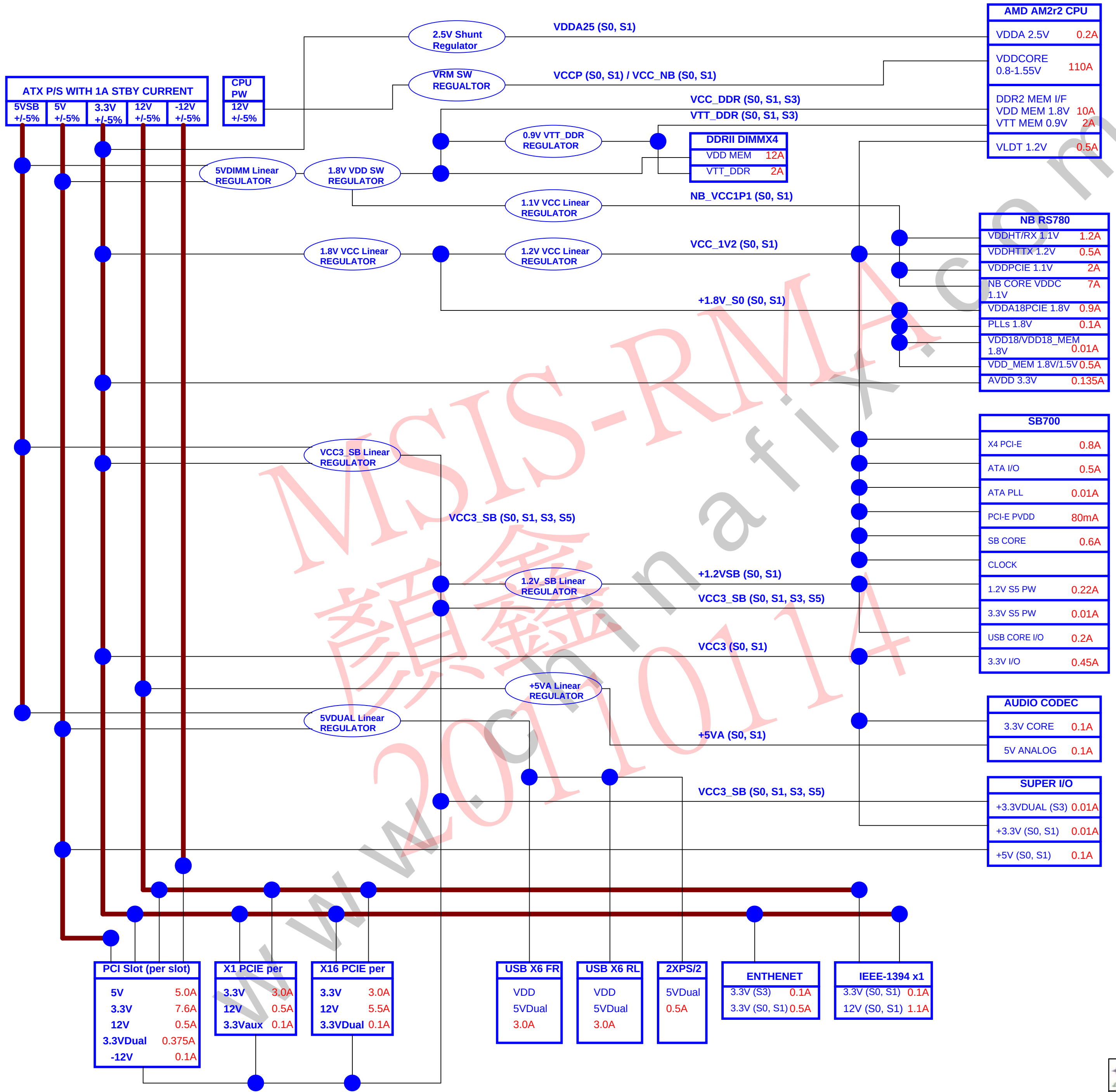
Power Deliver Chart



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Title	Power Deliver Chart	
Size C	Document Number MS-7459	Rev 1.0
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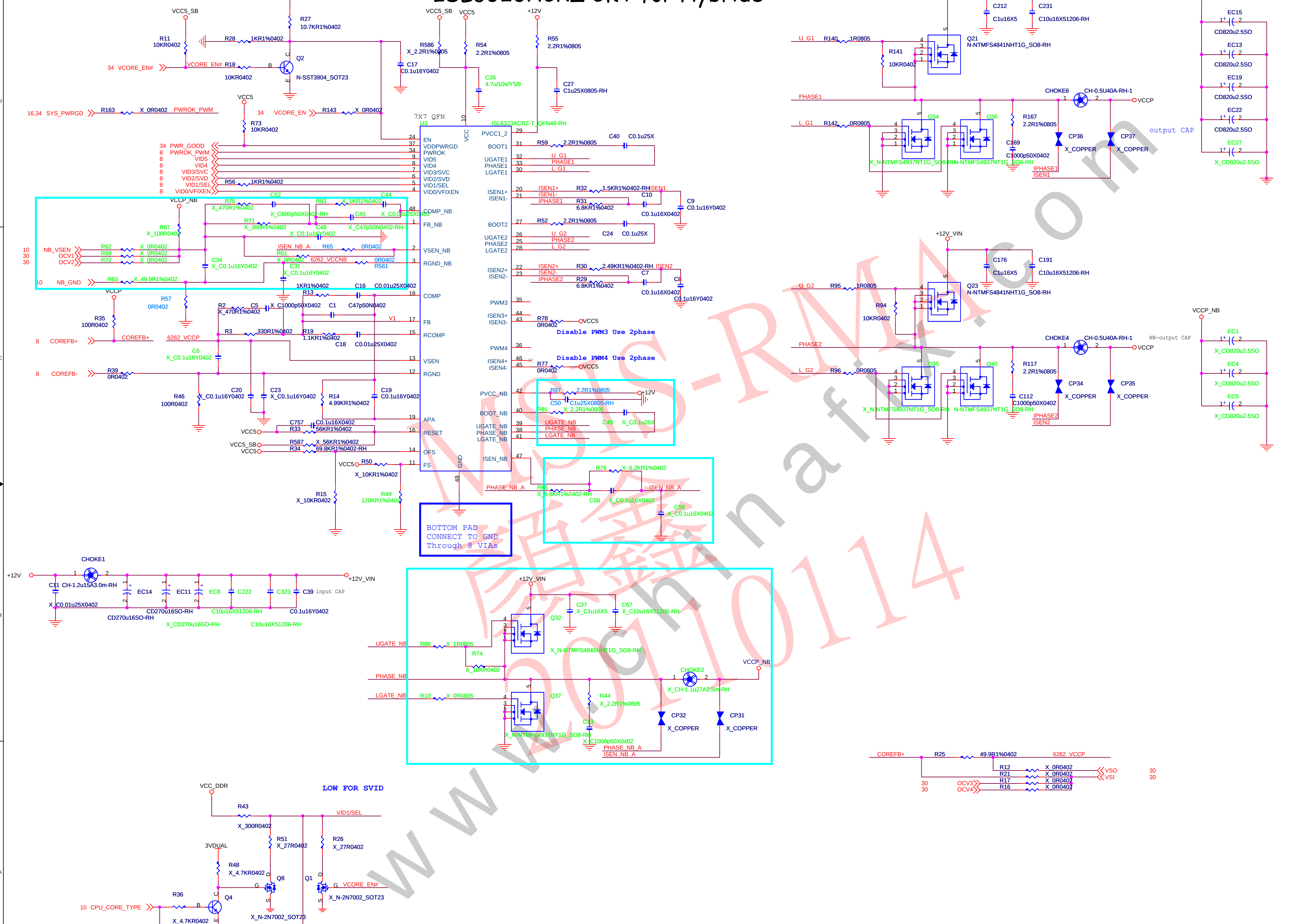
ISL6323ACRZ CKT for Hybride



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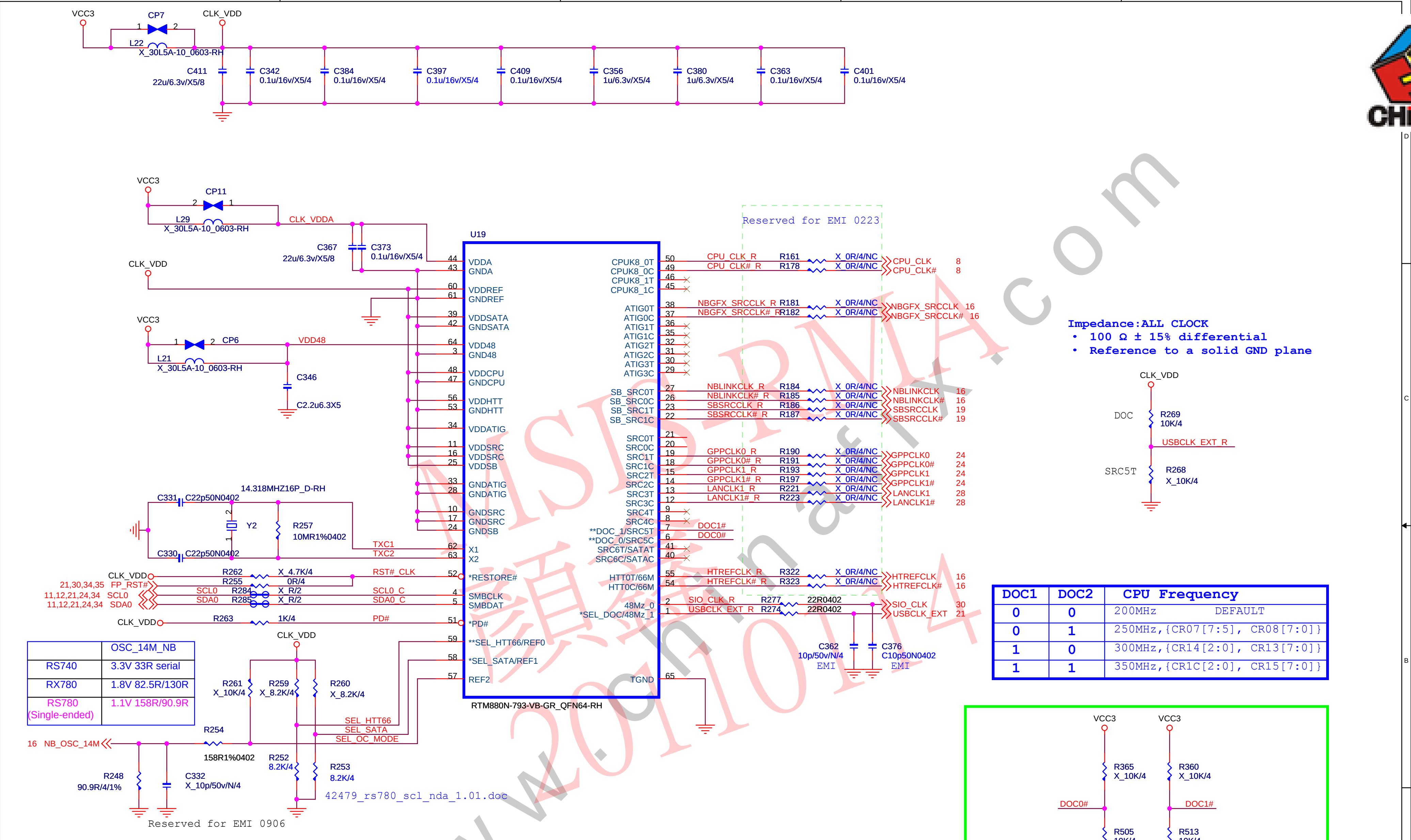

	OSC_14M_NB
RS740	3.3V 33R serial
RX780	1.8V 82.5R/130R
RS780 (Single-ended)	1.1V 158R/90.9R

DOC1	DOC2	CPU Frequency
0	0	200MHz DEFAULT
0	1	250MHz,{CR07[7:5], CR08[7:0]}
1	0	300MHz,{CR14[2:0], CR13[7:0]}
1	1	350MHz,{CR1C[2:0], CR15[7:0]}

	HTT CLOCK	
REF0/SEL_HTT66	0	100.00 DIFFERENTIAL
	1	66.66 SINGLE END
REF/SEL_SATA	PIN40,41 SRC6T/C and SATAT_LPRS select	
	0	100MHz differential spreading SRC clock
	1	100MHz non-spreading differential SATA clock
REF2	atched input to select pin functionality	
	0	ATIG/SRC PCIE Gen2 Mode with limited overclocking ability
	1	ATIG/SRC PCIE Gen1 Mode with higher overclocking ability

EXT CLK FREQUENCY SELECT TABLE(MHZ)

FS2	FS1	FS0	CPU	SRCCLK [2:1]	HTT	PCI	USB	COMMENT
0	0	0	Hi-Z	100.00	Hi-Z	Hi-Z	48.00	Reserved
0	0	1	X	100.00	X/3	X/6	48.00	Reserved
0	1	0	180.00	100.00	60.00	30.00	48.00	Reserved
0	1	1	220.00	100.00	36.56	73.12	48.00	Reserved
1	0	0	100.00	100.00	66.66	33.33	48.00	Reserved
1	0	1	133.33	100.00	66.66	33.33	48.00	Reserved
1	1	1	200.00	100.00	66.66	33.33	48.00	Normal HAMMER operation

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Title: *Clock-Gen ICS9LPRS477*

Rev 1.0

Document Number: *MS-7459*

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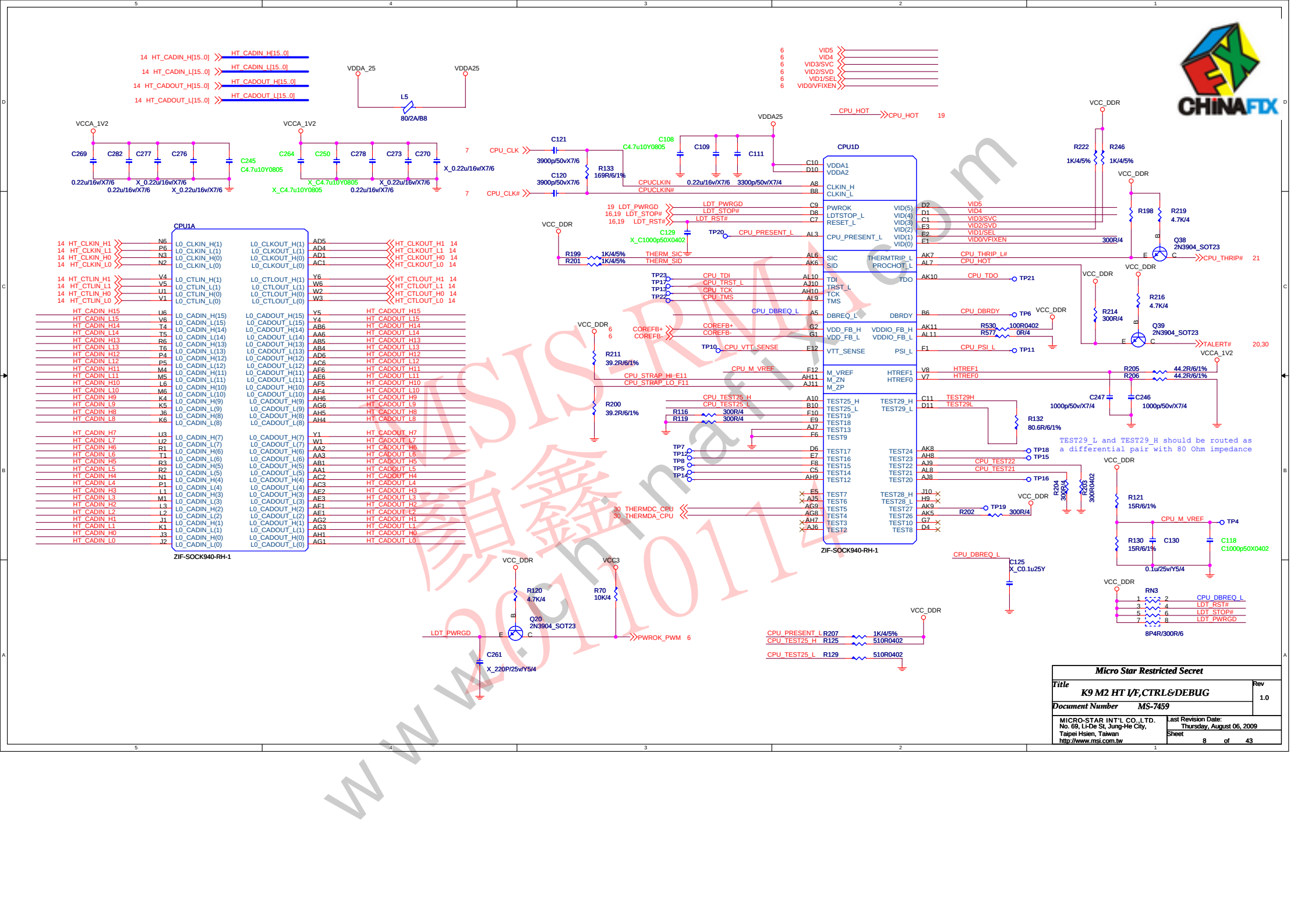
CPU1A
ZIF-SOCK940-RH-1
CPU1D
ZIF-SOCK940-RH-1
Micro Star Restricted Secret
Title
K9 M2 HT I/F,CTRL&DEBUG
Rev
1.0
Document Number
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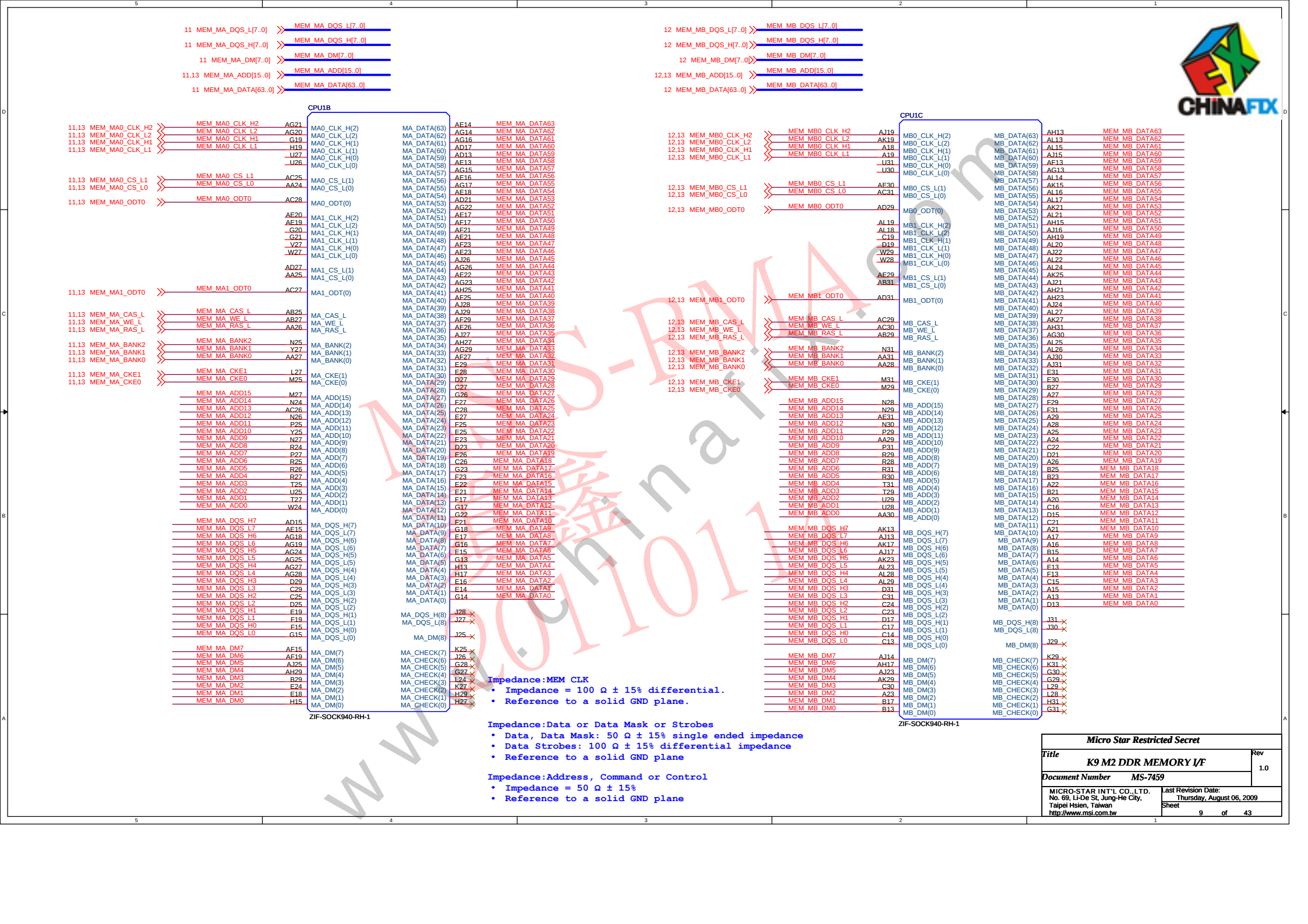
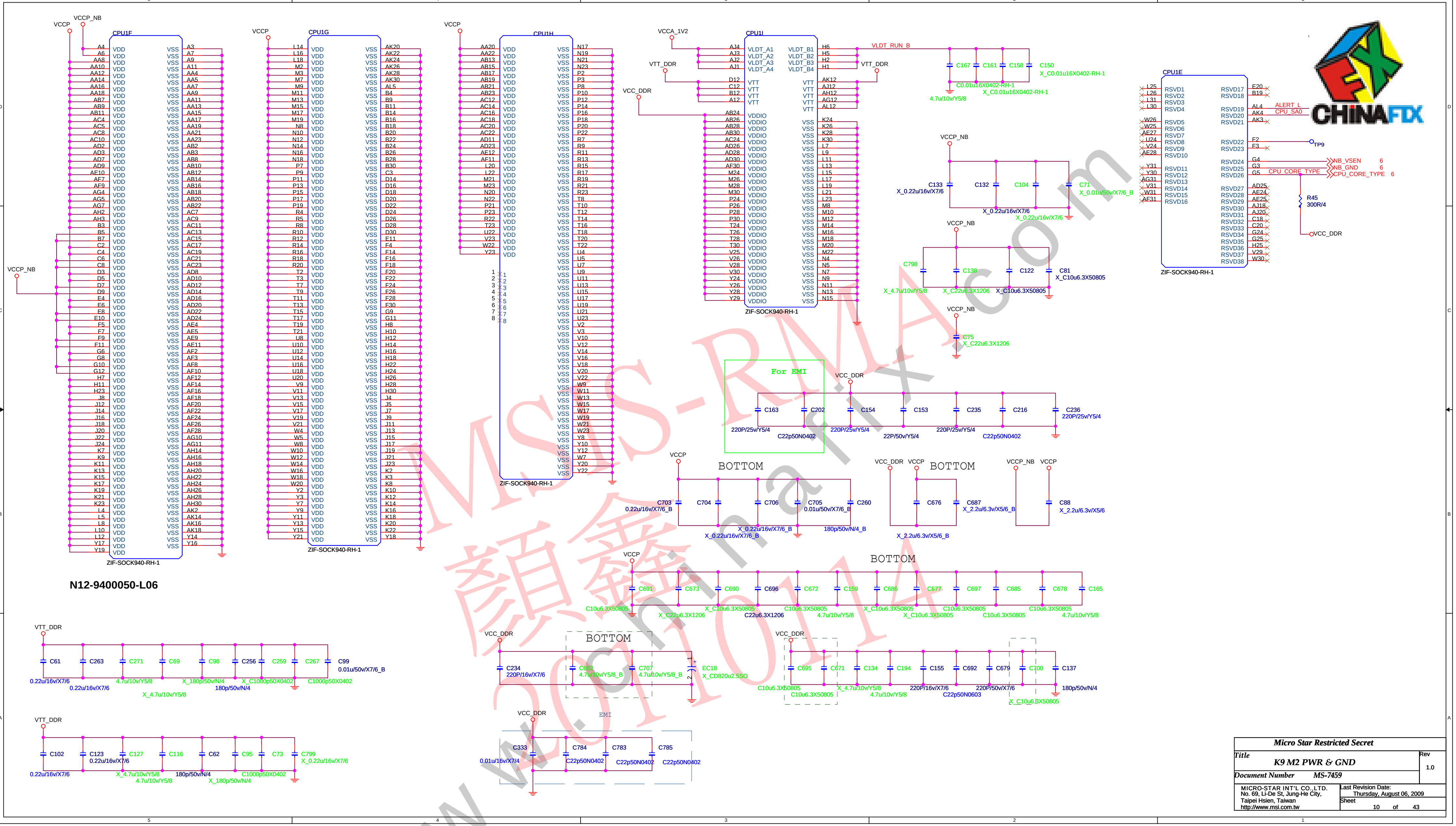
TEST29_L and TEST29_H should be routed as
a differential pair with 80 Ohm impedance
8P4R/300R/6





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Title: K9 M2 PWR & GND

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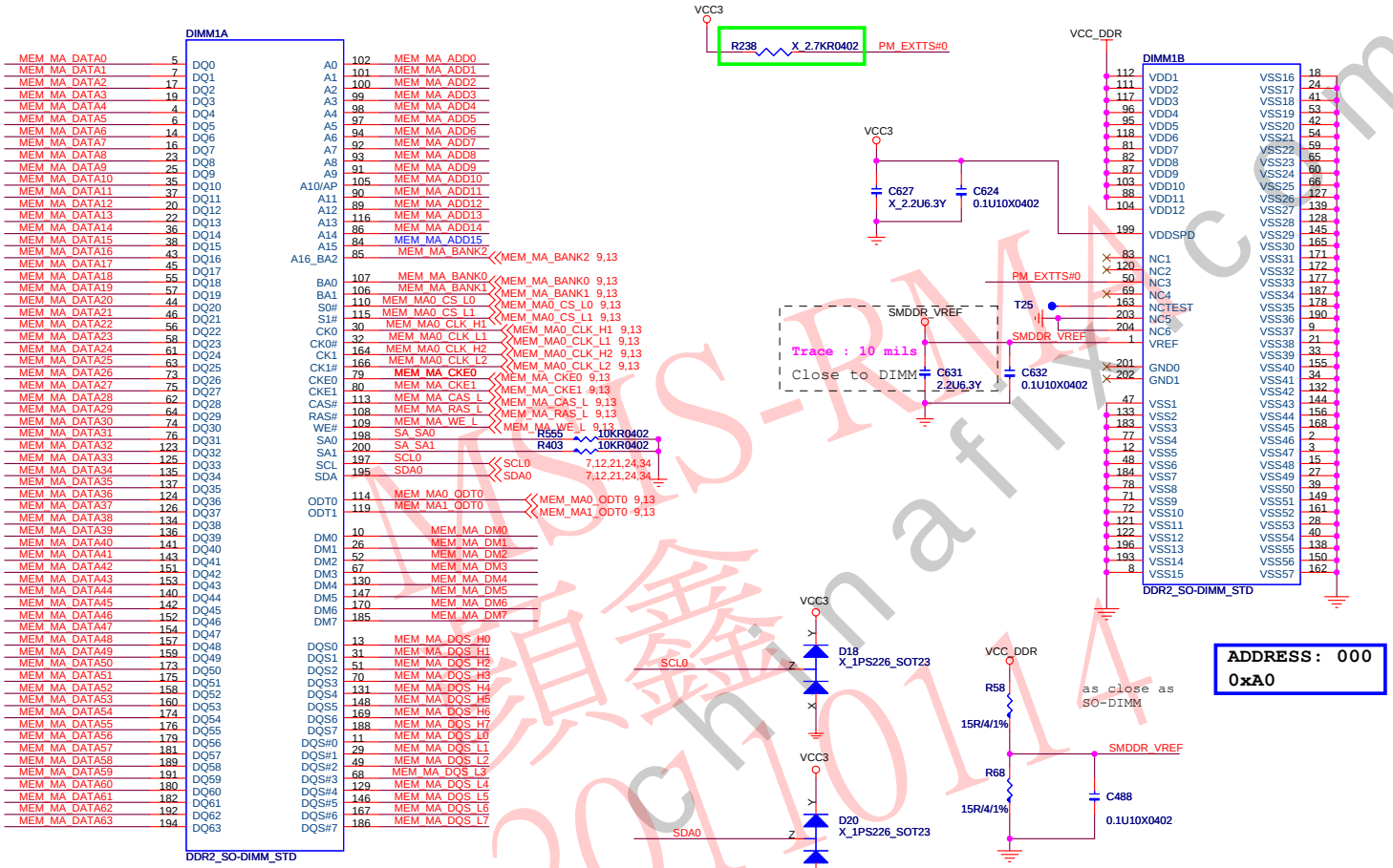
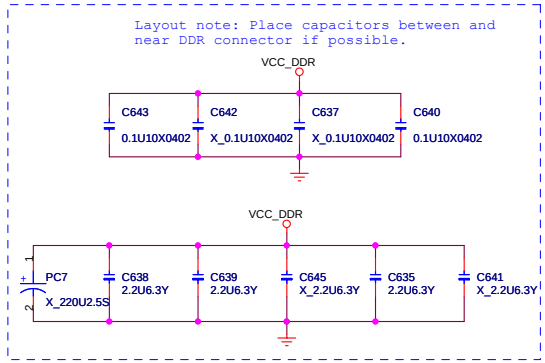
DDRII SODIMM A0

ADDR=1010000B

9 MEM_MA_DQS_H[7..0] >> MEM_MA_DQS_H[7..0]
9 MEM_MA_DQS_L[7..0] >> MEM_MA_DQS_L[7..0]
9 MEM_MA_DM[7..0] >> MEM_MA_DM[7..0]
9,13 MEM_MA_ADD[15..0] >> MEM_MA_ADD[15..0]
9 MEM_MA_DATA[63..0] >> MEM_MA_DATA[63..0]





Title	DDR SO-DIMM1
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DDRII SODIMM B0

ADDR=1010010B

9 MEM_MB_DQS_L[7..0] — MEM_MB_DQS_L[7..0]
9 MEM_MB_DQS_H[7..0] — MEM_MB_DQS_H[7..0]
9 MEM_MB_DM[7..0] — MEM_MB_DM[7..0]
9,13 MEM_MB_ADD[15..0] — MEM_MB_ADD[15..0]
9 MEM_MB_DATA[63..0] — MEM_MB_DATA[63..0]

DIMM2A

MEM_MB_DATA0	5	DQ0	A0	102	MEM_MB_ADD0
MEM_MB_DATA1	7	DQ1	A1	101	MEM_MB_ADD1
MEM_MB_DATA2	17	DQ2	A2	100	MEM_MB_ADD2
MEM_MB_DATA3	19	DQ3	A3	99	MEM_MB_ADD3
MEM_MB_DATA4	4	DQ4	A4	98	MEM_MB_ADD4
MEM_MB_DATA5	6	DQ5	A5	97	MEM_MB_ADD5
MEM_MB_DATA6	14	DQ6	A6	94	MEM_MB_ADD6
MEM_MB_DATA7	16	DQ7	A7	92	MEM_MB_ADD7
MEM_MB_DATA8	23	DQ8	A8	93	MEM_MB_ADD8
MEM_MB_DATA9	25	DQ9	A9	91	MEM_MB_ADD9
MEM_MB_DATA10	35	DQ10	A10/AP	105	MEM_MB_ADD10
MEM_MB_DATA11	37	DQ11	A11	90	MEM_MB_ADD11
MEM_MB_DATA12	20	DQ12	A12	89	MEM_MB_ADD12
MEM_MB_DATA13	22	DQ13	A13	116	MEM_MB_ADD13
MEM_MB_DATA14	36	DQ14	A14	86	MEM_MB_ADD14
MEM_MB_DATA15	38	DQ15	A15	84	MEM_MB_ADD15
MEM_MB_DATA16	43	DQ16	A16_BA2	85	MEM_MB_BANK2 — MEM_MB_BANK2 9,13
MEM_MB_DATA17	45	DQ17			
MEM_MB_DATA18	55	DQ18	BA0	107	MEM_MB_BANK0 — MEM_MB_BANK0 9,13
MEM_MB_DATA19	57	DQ19	BA1	106	MEM_MB_BANK1 — MEM_MB_BANK1 9,13
MEM_MB_DATA20	44	DQ20	S0#	110	MEM_MB0_CS_L0 — MEM_MB0_CS_L0 9,13
MEM_MB_DATA21	46	DQ21	S1#	115	MEM_MB0_CS_L1 — MEM_MB0_CS_L1 9,13
MEM_MB_DATA22	56	DQ22	CK0	30	MEM_MB0_CLK_H1 — MEM_MB0_CLK_H1 9,13
MEM_MB_DATA23	58	DQ23	CK0#	32	MEM_MB0_CLK_L1 — MEM_MB0_CLK_L1 9,13
MEM_MB_DATA24	61	DQ24	CK1	164	MEM_MB0_CLK_H2 — MEM_MB0_CLK_H2 9,13
MEM_MB_DATA25	63	DQ25	CK1#	166	MEM_MB0_CLK_L2 — MEM_MB0_CLK_L2 9,13
MEM_MB_DATA26	73	DQ26	CKE0	79	MEM_MB_CKE0 — MEM_MB_CKE0 9,13
MEM_MB_DATA27	75	DQ27	CKE1	80	MEM_MB_CKE1 — MEM_MB_CKE1 9,13
MEM_MB_DATA28	62	DQ28	CAS#	113	MEM_MB_CAS_L — MEM_MB_CAS_L 9,13
MEM_MB_DATA29	64	DQ29	RAS#	108	MEM_MB_RAS_L — MEM_MB_RAS_L 9,13
MEM_MB_DATA30	74	DQ30	WE#	109	MEM_MB_WE_L — MEM_MB_WE_L 9,13
MEM_MB_DATA31	76	DQ31	SA0	198	SB_SA0
MEM_MB_DATA32	123	DQ32	SA1	200	SB_SA1
MEM_MB_DATA33	125	DQ33	SCL	197	SCL0 — SCL0 7,11,21,24,34
MEM_MB_DATA34	135	DQ34	SDA	195	SDA0 — SDA0 7,11,21,24,34
MEM_MB_DATA35	137	DQ35			
MEM_MB_DATA36	124	DQ36	ODT0	114	MEM_MB0_ODT0 — MEM_MB0_ODT0 9,13
MEM_MB_DATA37	126	DQ37	ODT1	119	MEM_MB1_ODT0 — MEM_MB1_ODT0 9,13
MEM_MB_DATA38	134	DQ38			
MEM_MB_DATA39	136	DQ39	DM0	10	MEM_MB_DM0
MEM_MB_DATA40	141	DQ40	DM1	26	MEM_MB_DM1
MEM_MB_DATA41	143	DQ41	DM2	52	MEM_MB_DM2
MEM_MB_DATA42	151	DQ42	DM3	67	MEM_MB_DM3
MEM_MB_DATA43	153	DQ43	DM4	130	MEM_MB_DM4
MEM_MB_DATA44	140	DQ44	DM5	147	MEM_MB_DM5
MEM_MB_DATA45	142	DQ45	DM6	170	MEM_MB_DM6
MEM_MB_DATA46	152	DQ46	DM7	185	MEM_MB_DM7
MEM_MB_DATA47	154	DQ47			
MEM_MB_DATA48	157	DQ48	DQS0	13	MEM_MB_DQS_H0
MEM_MB_DATA49	159	DQ49	DQS1	31	MEM_MB_DQS_H1
MEM_MB_DATA50	173	DQ50	DQS2	51	MEM_MB_DQS_H2
MEM_MB_DATA51	175	DQ51	DQS3	70	MEM_MB_DQS_H3
MEM_MB_DATA52	158	DQ52	DQS4	131	MEM_MB_DQS_H4
MEM_MB_DATA53	160	DQ53	DQS5	148	MEM_MB_DQS_H5
MEM_MB_DATA54	174	DQ54	DQS6	169	MEM_MB_DQS_H6
MEM_MB_DATA55	176	DQ55	DQS7	188	MEM_MB_DQS_H7
MEM_MB_DATA56	179	DQ56	DQS#0	11	MEM_MB_DQS_L0
MEM_MB_DATA57	181	DQ57	DQS#1	29	MEM_MB_DQS_L1
MEM_MB_DATA58	189	DQ58	DQS#2	49	MEM_MB_DQS_L2
MEM_MB_DATA59	191	DQ59	DQS#3	68	MEM_MB_DQS_L3
MEM_MB_DATA60	180	DQ60	DQS#4	129	MEM_MB_DQS_L4
MEM_MB_DATA61	182	DQ61	DQS#5	146	MEM_MB_DQS_L5
MEM_MB_DATA62	192	DQ62	DQS#6	167	MEM_MB_DQS_L6
MEM_MB_DATA63	194	DQ63	DQS#7	186	MEM_MB_DQS_L7

DDR2_SO-DIMM_STD

VCC3 — R390 X_2.7KR0402 — PM_EXTTS#1

VCC_DDR — DIMM2B

112	VDD1	VSS16	18
111	VDD2	VSS17	24
117	VDD3	VSS18	41
96	VDD4	VSS19	53
95	VDD5	VSS20	42
118	VDD6	VSS21	54
81	VDD7	VSS22	59
82	VDD8	VSS23	65
87	VDD9	VSS24	60
103	VDD10	VSS25	66
88	VDD11	VSS26	127
104	VDD12	VSS27	139
		VSS28	128
199	VDDSPD	VSS29	145
		VSS30	165
83	NC1	VSS31	171
120	NC2	VSS32	172
50	NC3	VSS33	177
69	NC4	VSS34	187
163	NCTEST	VSS35	178
203	NC5	VSS36	190
204	NC6	VSS37	9
1	VREF	VSS38	21
		VSS39	33
201	GND0	VSS40	155
202	GND1	VSS41	34
		VSS42	132
47	VSS1	VSS43	144
133	VSS2	VSS44	156
183	VSS3	VSS45	168
77	VSS4	VSS46	2
12	VSS5	VSS47	3
48	VSS6	VSS48	15
184	VSS7	VSS49	27
78	VSS8	VSS50	39
71	VSS9	VSS51	149
72	VSS10	VSS52	161
121	VSS11	VSS53	28
122	VSS12	VSS54	40
196	VSS13	VSS55	138
193	VSS14	VSS56	150
8	VSS15	VSS57	162

DDR2_SO-DIMM_STD

VCC3 — C650 X_2.2U6.3Y — C625 0.1U10X0402

PM_EXTTS#1 — T26

SMDDR_VREF — Trace : 10 mils — SMDDR_VREF — C651 2.2U6.3Y — C649 0.1U10X0402

VCC3 — SB_SA0 — R553 10KR0402 — SB_SA1 — R554 10KR0402

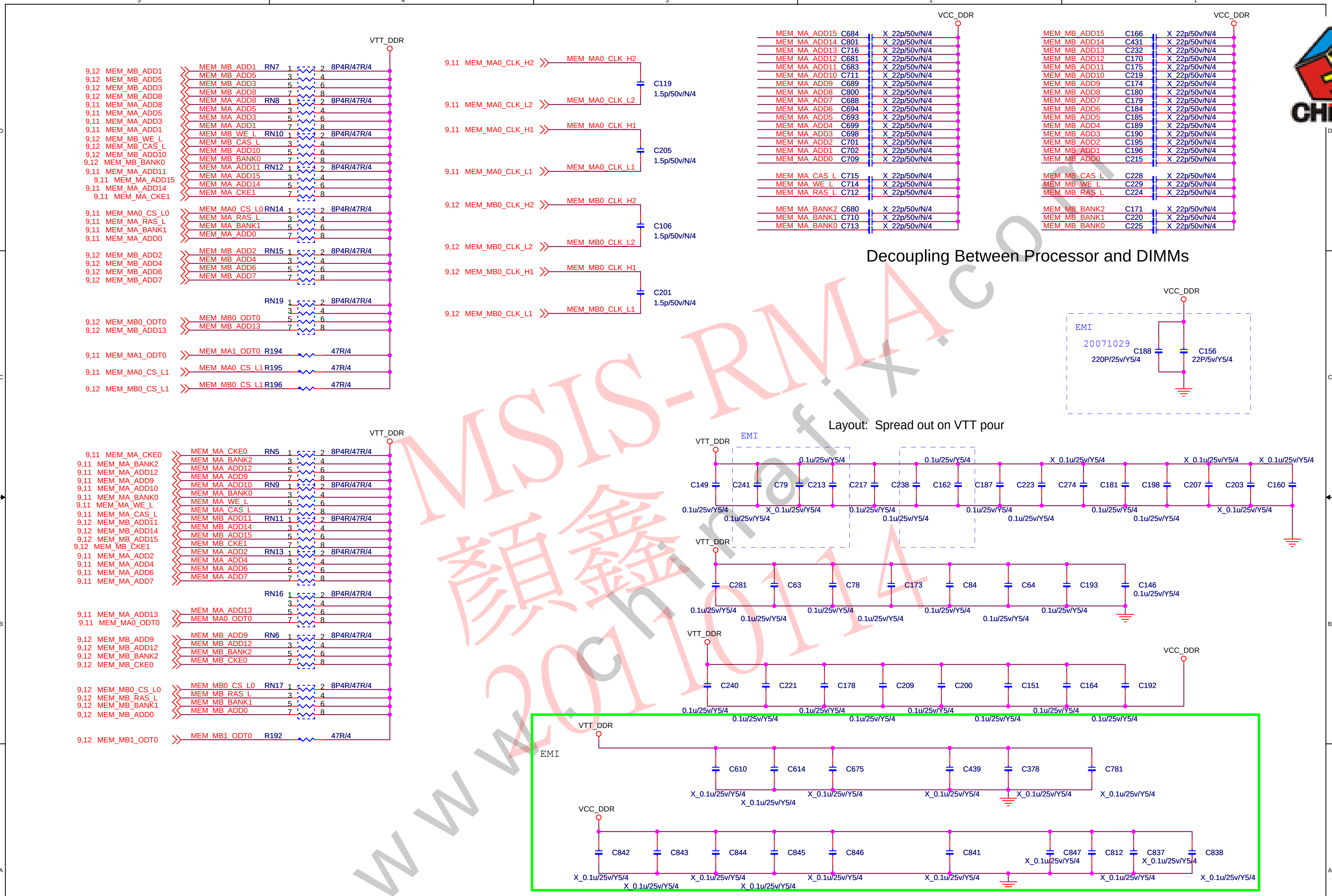
ADDRESS: 001
0xA2

Layout note: Place capacitors between and near DDR connector if possible.

VCC_DDR — C440 0.1U10X0402 — C571 0.1U10X0402 — C43 0.1U10X0402 — C42 0.1U10X0402

VCC_DDR — C28 2.2U6.3Y — C551 2.2U6.3Y — C634 2.2U6.3Y — C47 2.2U6.3Y — C36 2.2U6.3Y

Micro Star Restricted Secret		
Title: DDR SO-DIMM2		Rev: 1.0
Document Number: MS-7459		
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Thursday, August 06, 2009	Sheet 12 of 43



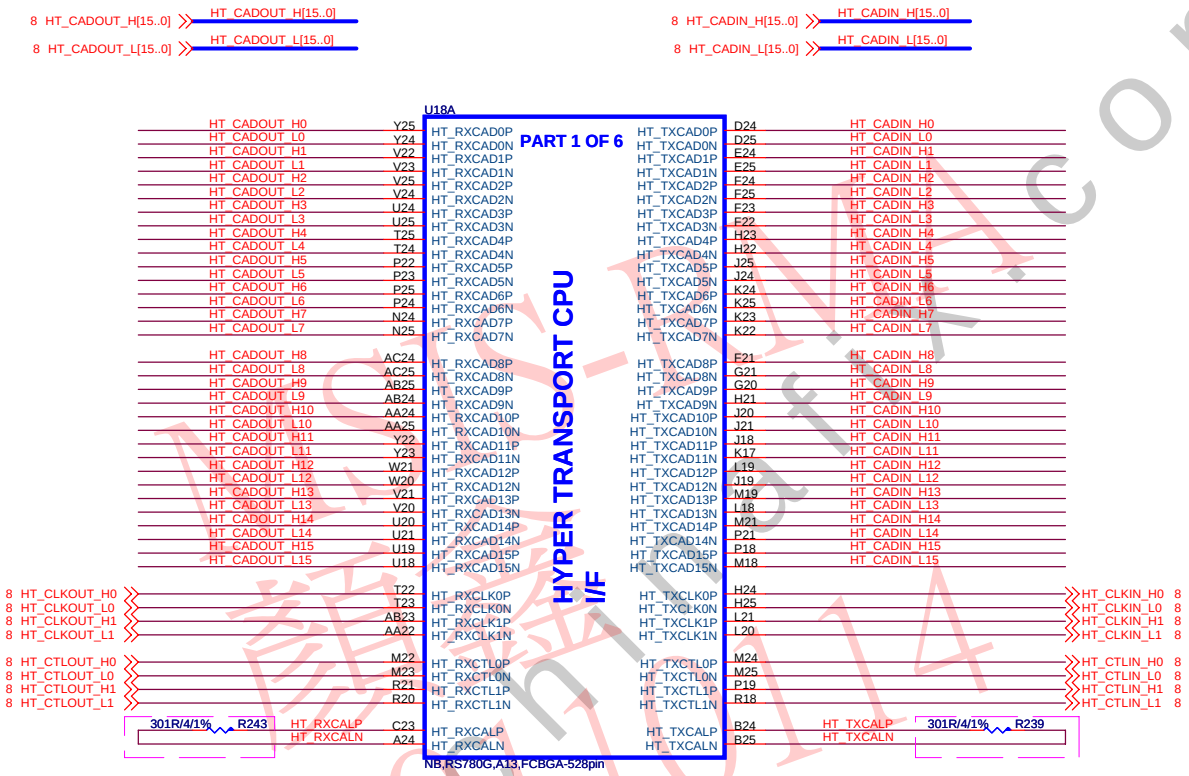
Micro Star Restricted Secret

Title	**DDR Termination**
Document Number	MS-7459
Rev	1.0

MICRO-STAR INT'L CO.,LTD.
No. 69, Li-De St, Jung-He City,
Taipei Hsien, Taiwan
http://www.msi.com.tw

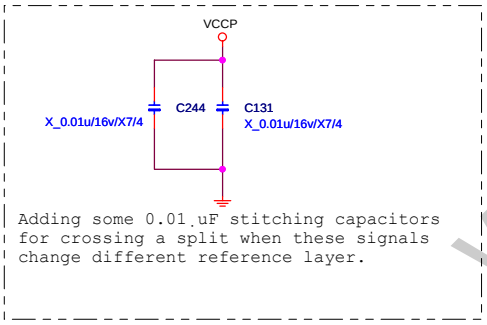
Last Revision Date: Thursday, August 06, 2009

Sheet 13 of 43

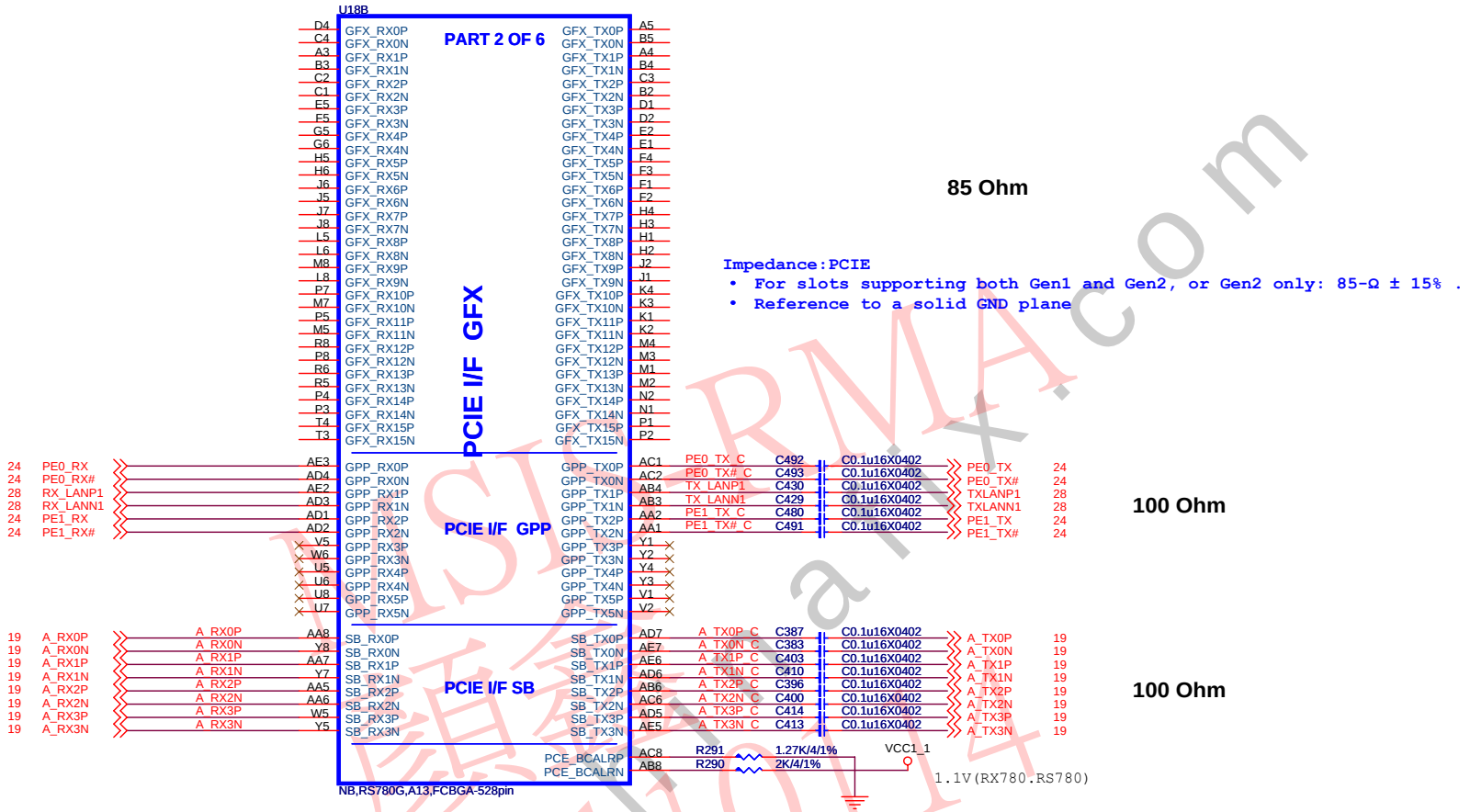


RX780/RS740/RS780 difference table (HT LINK)

SIGNALS	RS740	RX780	RS780
HT_RXCALP	49.9R (GND)	1.21K	301R
HT_RXCALN	49.9R (VDDHT)		
HT_TXCALP HT_TXCALN	100R	1.21K	301R



MICRO-STAR INt'L CO., LTD.		
Title: RS780-HT L		
Size	Document Number: MS-7459	Rev: 1.0
Date: Thursday, August 06, 2009	Sheet 14 of 43	



RX780/RS740/RS780 GPP difference table

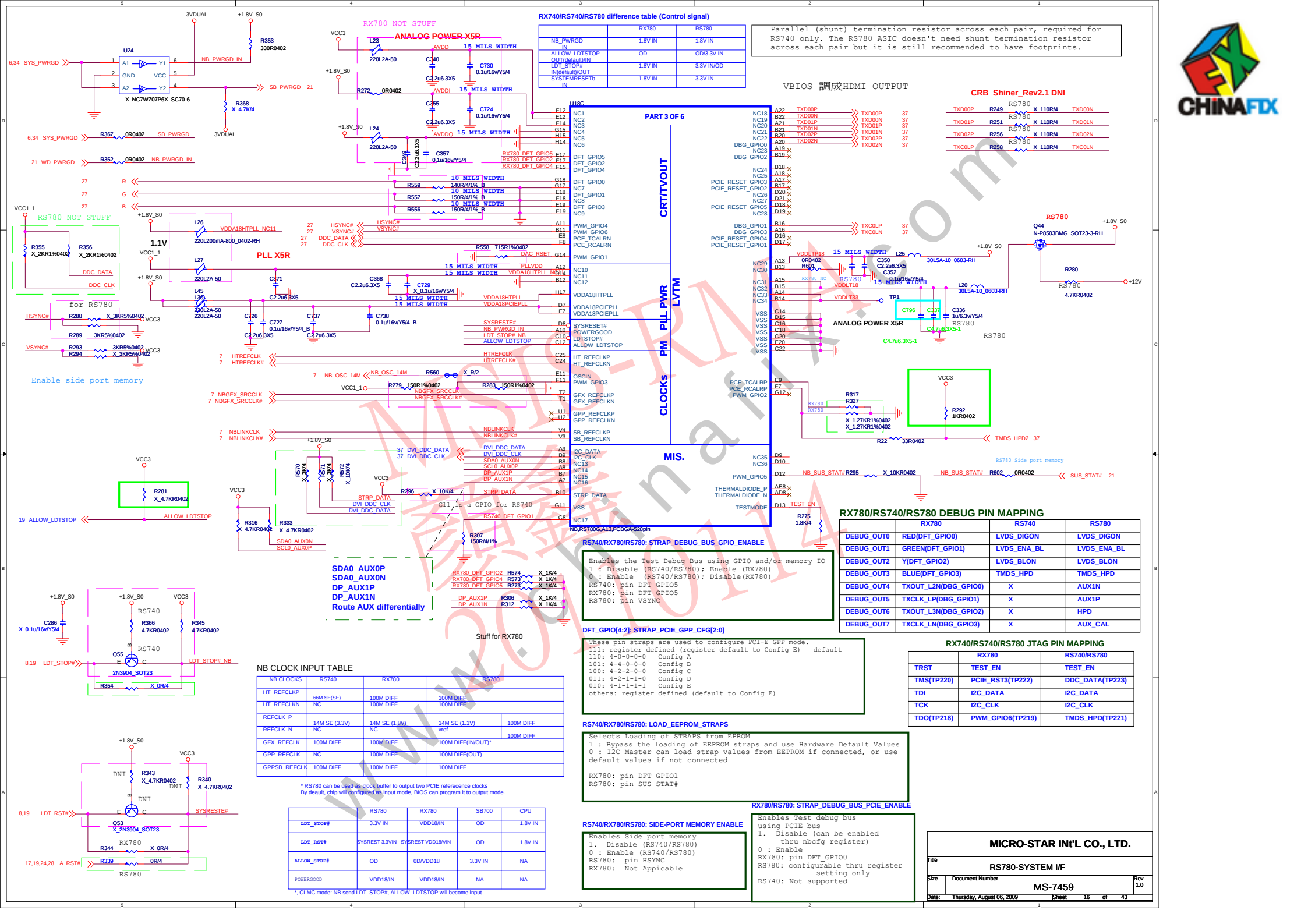
	RS740	RX780/RS780
PCE_CALRP	562R (GND)	1.27K (GND)
GPP4	NC	GPP4
GPP5	NC	GPP5

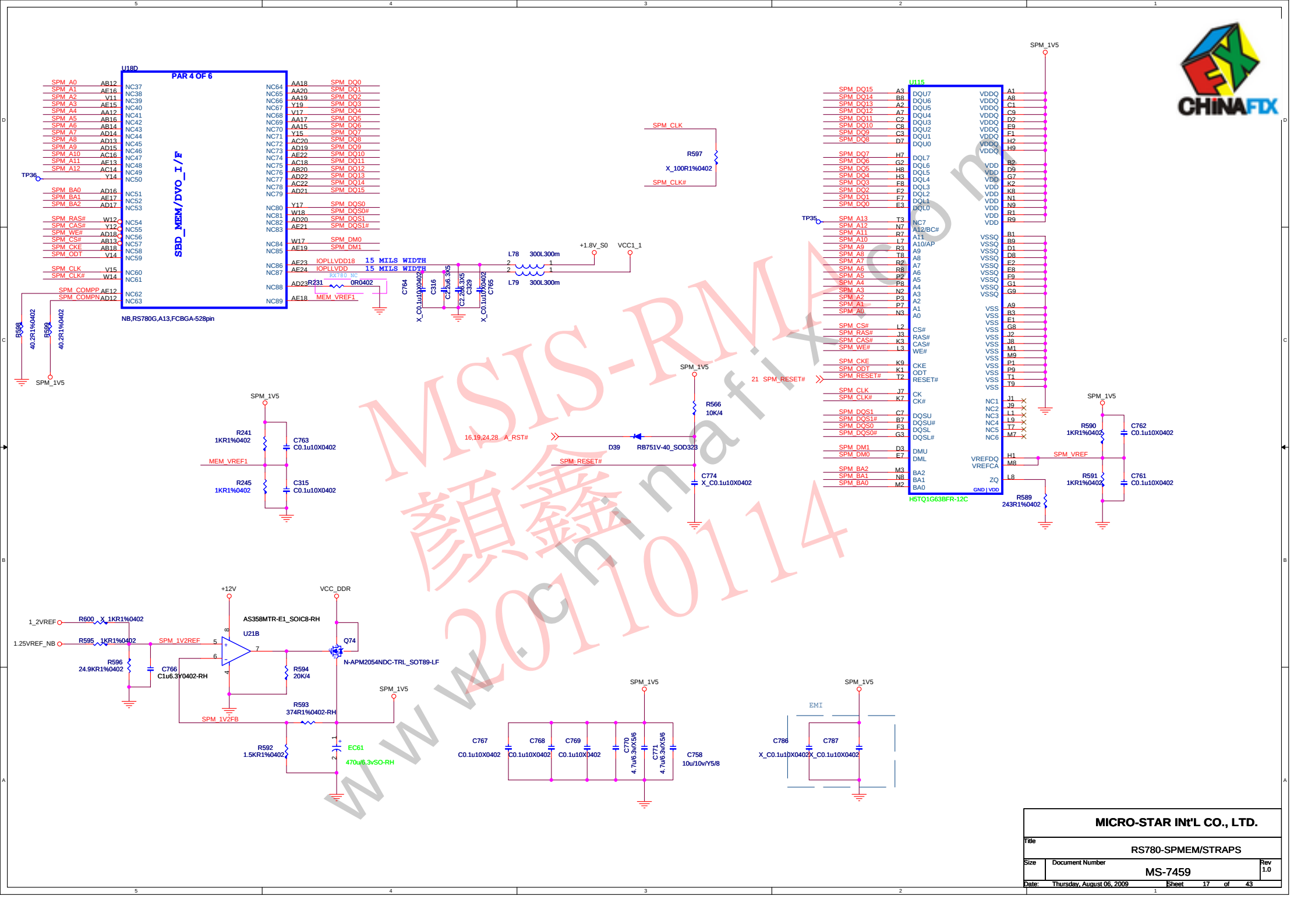
RS780 Display Port Support (muxed on GFX)

DP0	GFX_TX0,TX1,TX2 and TX3 AUX0 and HPD0
DP1	GFX_TX4,TX5,TX6 and TX7 AUX1 and HPD1

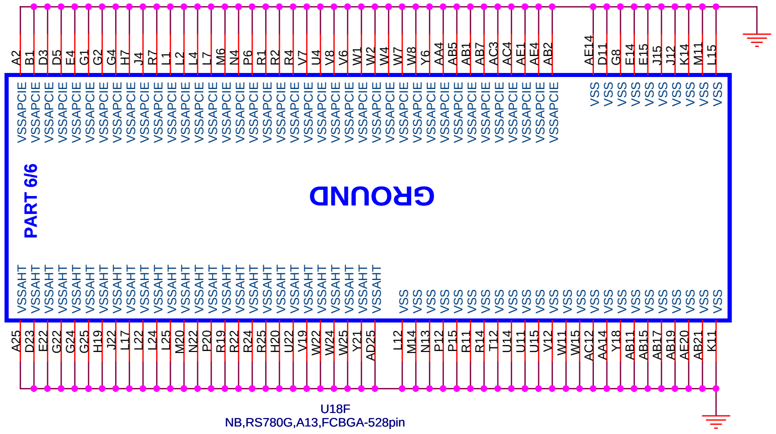
MICRO-STAR INt'L CO., LTD.

Title	RS780-PCIE I/F	
Size	Document Number: MS-7459	Rev: 1.0
Date: Thursday, August 06, 2009	Sheet 15 of 43	


RX740/RS740/RS780 difference table (Control signal)
Parallel (shunt) termination resistor across each pair, required for RS740 only. The RS780 ASIC doesn't need shunt termination resistor across each pair but it is still recommended to have footprints.
VBIOS 調成HDMI OUTPUT
CRB Shiner_Rev2.1 DNI
RS780 NOT STUFF
ANALOG POWER X5R
PLL X5R
1.1V
Enable side port memory
SDA0_AUX0P
SDA0_AUX0N
DP_AUX1P
DP_AUX1N
Route AUX differentially
Stuff for RX780
RX780/RS740/RS780 DEBUG PIN MAPPING
RX780/RS740/RS780 JTAG PIN MAPPING
NB CLOCK INPUT TABLE
RS740/RX780/RS780: STRAP_DEBUG_BUS_GPIO_ENABLE
DFT_GPIO[4:2]: STRAP_PCIE_GPP_CFG[2:0]
RS740/RX780/RS780: LOAD_EEPROM_STRAPS
RS740/RX780/RS780: SIDE-PORT MEMORY ENABLE
RX780/RS780: STRAP_DEBUG_BUS_PCIE_ENABLE
MICRO-STAR INt'L CO., LTD.
RS780-SYSTEM I/F
MS-7459
Thursday, August 06, 2009

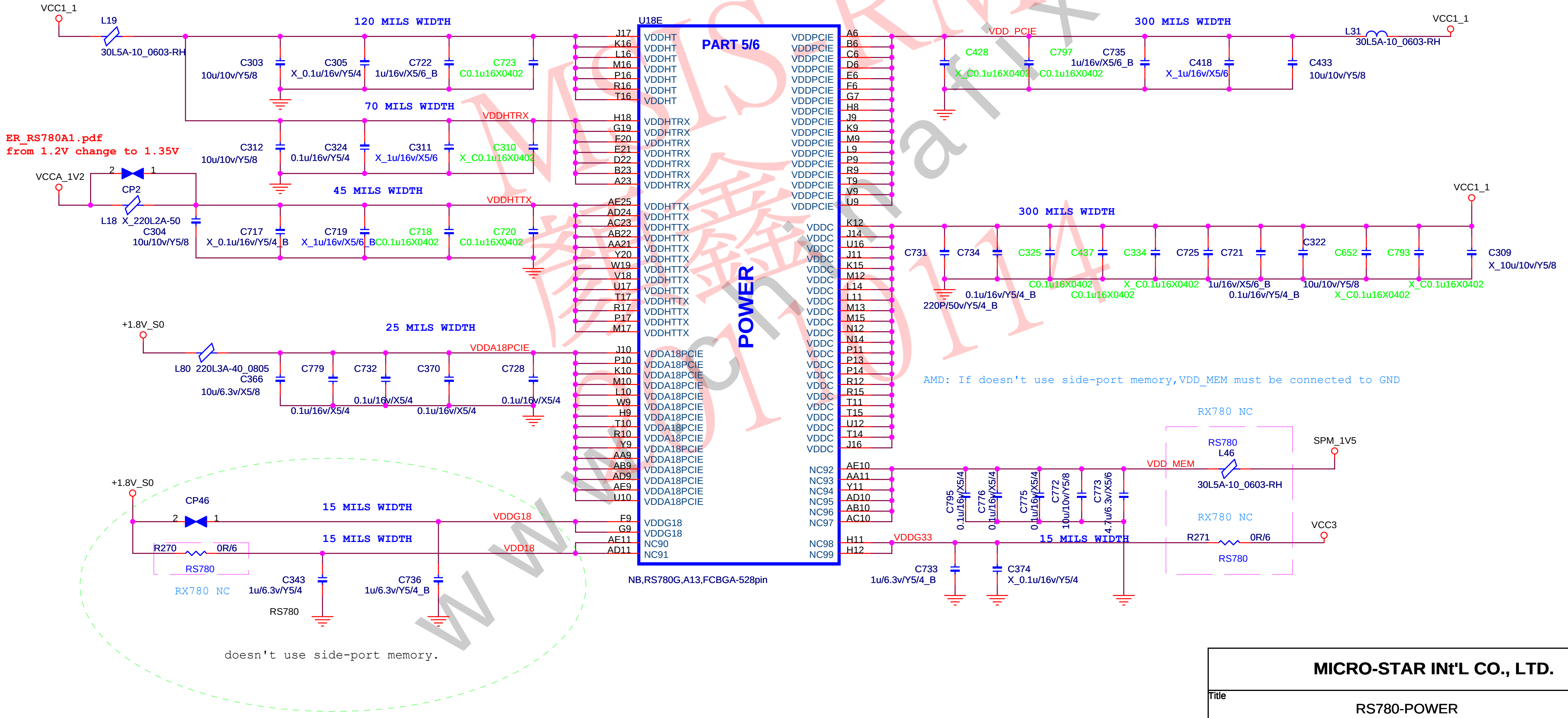


MICRO-STAR INt'L CO., LTD.	
Title	RS780-SPMEM/STRAPS
Size	Document Number: MS-7459 — Rev: 1.0
Date: Thursday, August 06, 2009	Sheet 17 of 43

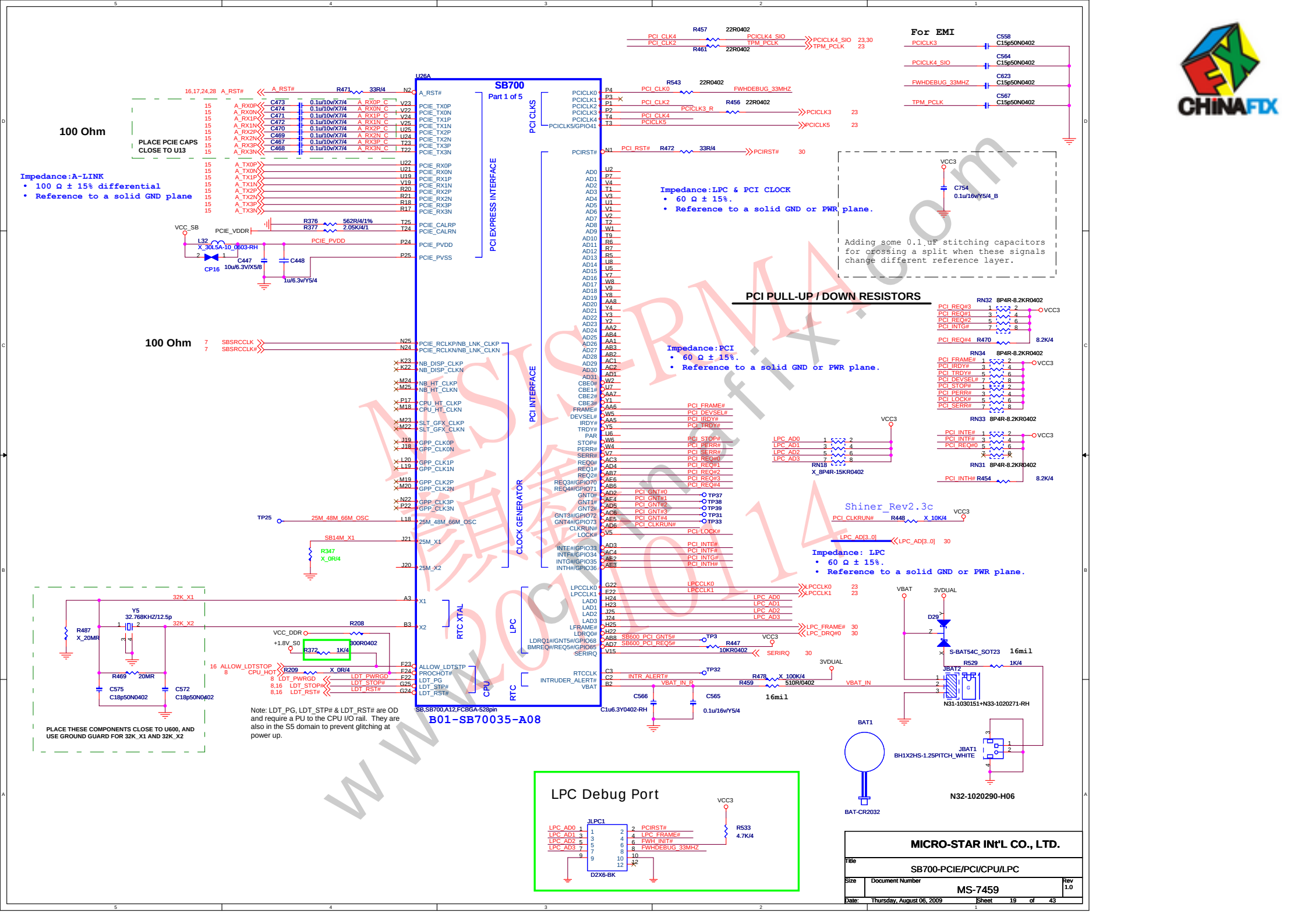


RS740/RX780/RS780 POWER DIFFERENCE TABLE

PIN NAME	RS740	RX780	RS780	PIN NAME	RS740	RX780	RS780
VDDHT	NC	+1.1V	+1.1V	IOPLLVDD	+1.2V	NC	+1.1V
VDDHTRX	NC	+1.1V	+1.1V	AVDD	+3.3V	NC	+3.3V
VDDHTTX	+1.2V	+1.2V	+1.2V	AVDDDI	+1.8V	NC	+1.8V
VDDA18PCIE	NC	+1.8V	+1.8V	AVDDQ	+1.8V	NC	+1.8V
VDD18	+1.8V	+1.8V	+1.8V	PLLVDD	+1.2V	NC	+1.1V
VDD18_MEM	NC	NC	+1.8V	PLLVDD18	+1.8V	NC	+1.8V
VDDPCIE	+1.2V	+1.1V	+1.1V	VDDA18PCIEPLL	+1.2V	+1.8V	+1.8V
VDDC	+1.2V	+1.1V	+1.1V	VDDA18HTPLL	+1.8V	+1.8V	+1.8V
VDD_MEM	+1.8V/1.5V	NC	+1.8V/1.5V	VDDLTP18	+1.8V	NC	+1.8V
VDD33	+3.3V	NC	+3.3V	VDDLT18	+1.8V	NC	+1.8V
IOPLLVDD18	+1.8V	NC	+1.8V	VDDLT33	+3.3V	NC	NC



MICRO-STAR INt'L CO., LTD.			
Title	RS780-POWER		
Size	Document Number	MS-7459	Rev 1.0
Date:	Thursday, August 06, 2009	Sheet 18 of 43	


SB700
Part 1 of 5
U26A
100 Ohm
PLACE PCIE CAPS CLOSE TO U13
Impedance:A-LINK
• 100 Ω ± 15% differential
• Reference to a solid GND plane
PCI EXPRESS INTERFACE
PCI CLKS
Impedance:LPC & PCI CLOCK
• 60 Ω ± 15%.
• Reference to a solid GND or PWR plane.
Adding some 0.1uF stitching capacitors for crossing a split when these signals change different reference layer.
For EMI
PCI PULL-UP / DOWN RESISTORS
Impedance:PCI
• 60 Ω ± 15%.
• Reference to a solid GND or PWR plane.
PCI INTERFACE
CLOCK GENERATOR
Shiner_Rev2.3c
Impedance: LPC
• 60 Ω ± 15%.
• Reference to a solid GND or PWR plane.
LPC
RTC XTAL
CPU
RTC
PLACE THESE COMPONENTS CLOSE TO U600, AND USE GROUND GUARD FOR 32K_X1 AND 32K_X2
Note: LDT_PG, LDT_STP# & LDT_RST# are OD and require a PU to the CPU I/O rail. They are also in the S5 domain to prevent glitching at power up.
SB,SB700,A12,FCBGA-528pin
B01-SB70035-A08
LPC Debug Port
BAT-CR2032
N31-1030151+N33-1020271-RH
N32-1020290-H06
MICRO-STAR INt'L CO., LTD.
SB700-PCIE/PCI/CPU/LPC
MS-7459
Thursday, August 06, 2009
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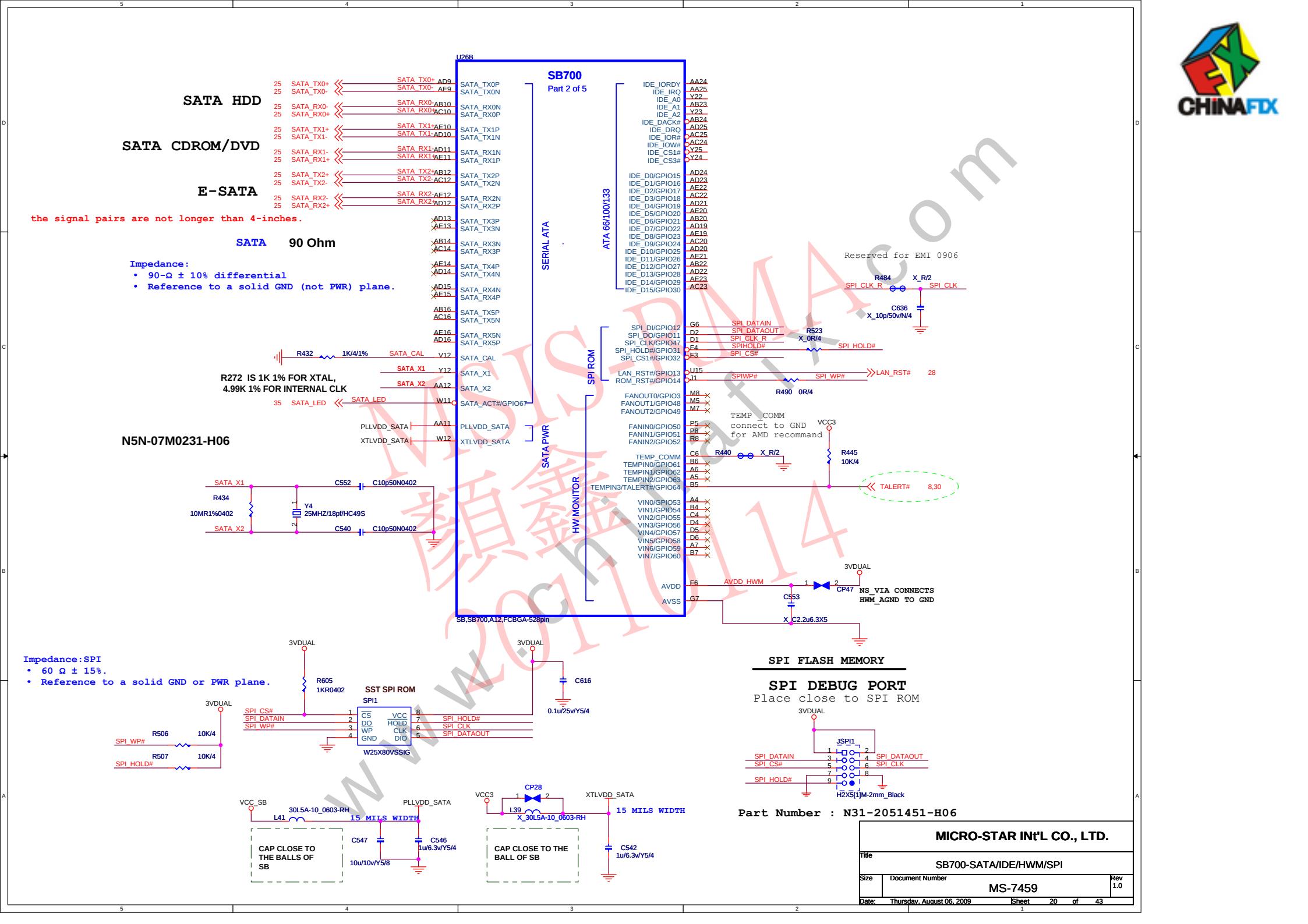
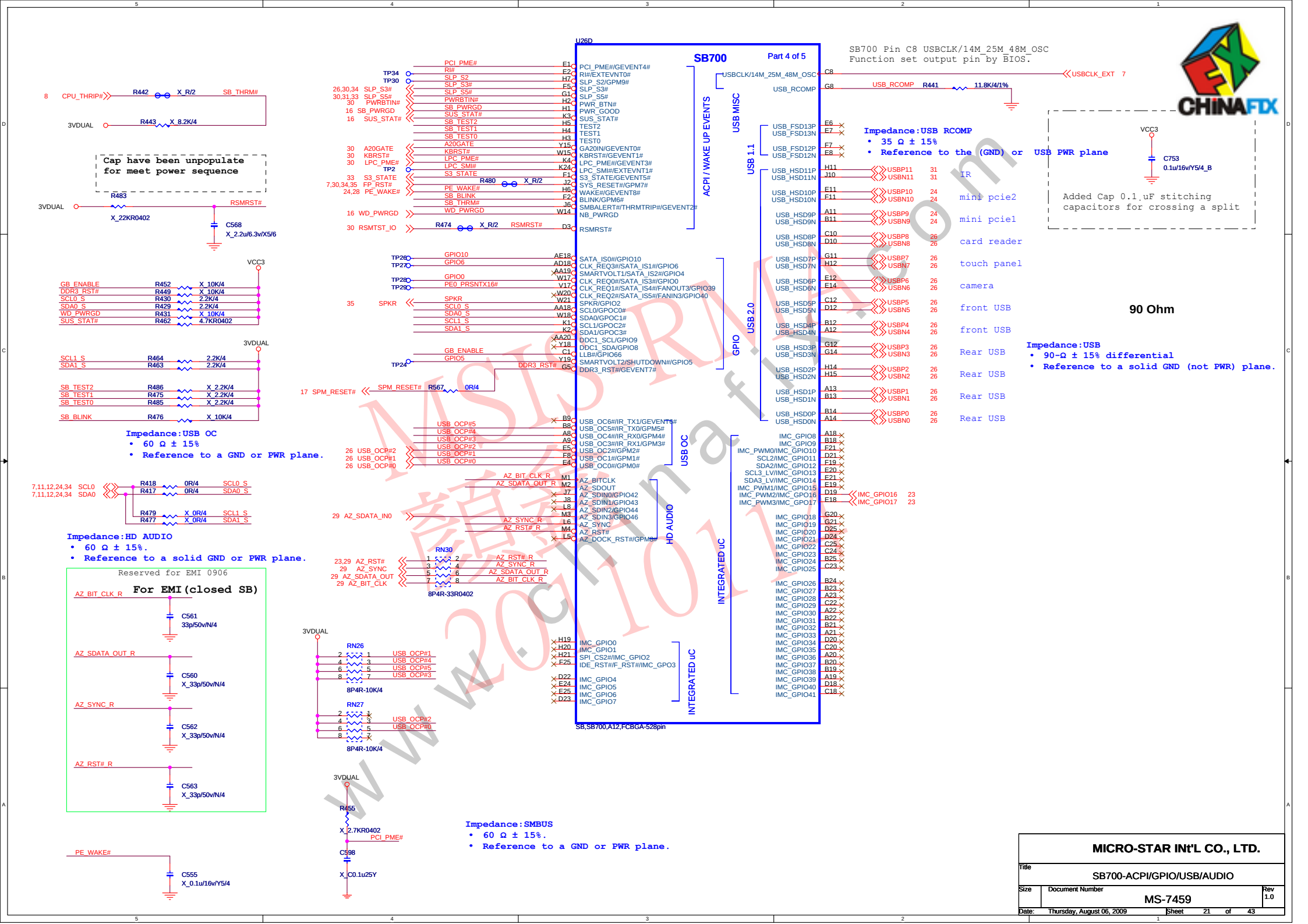
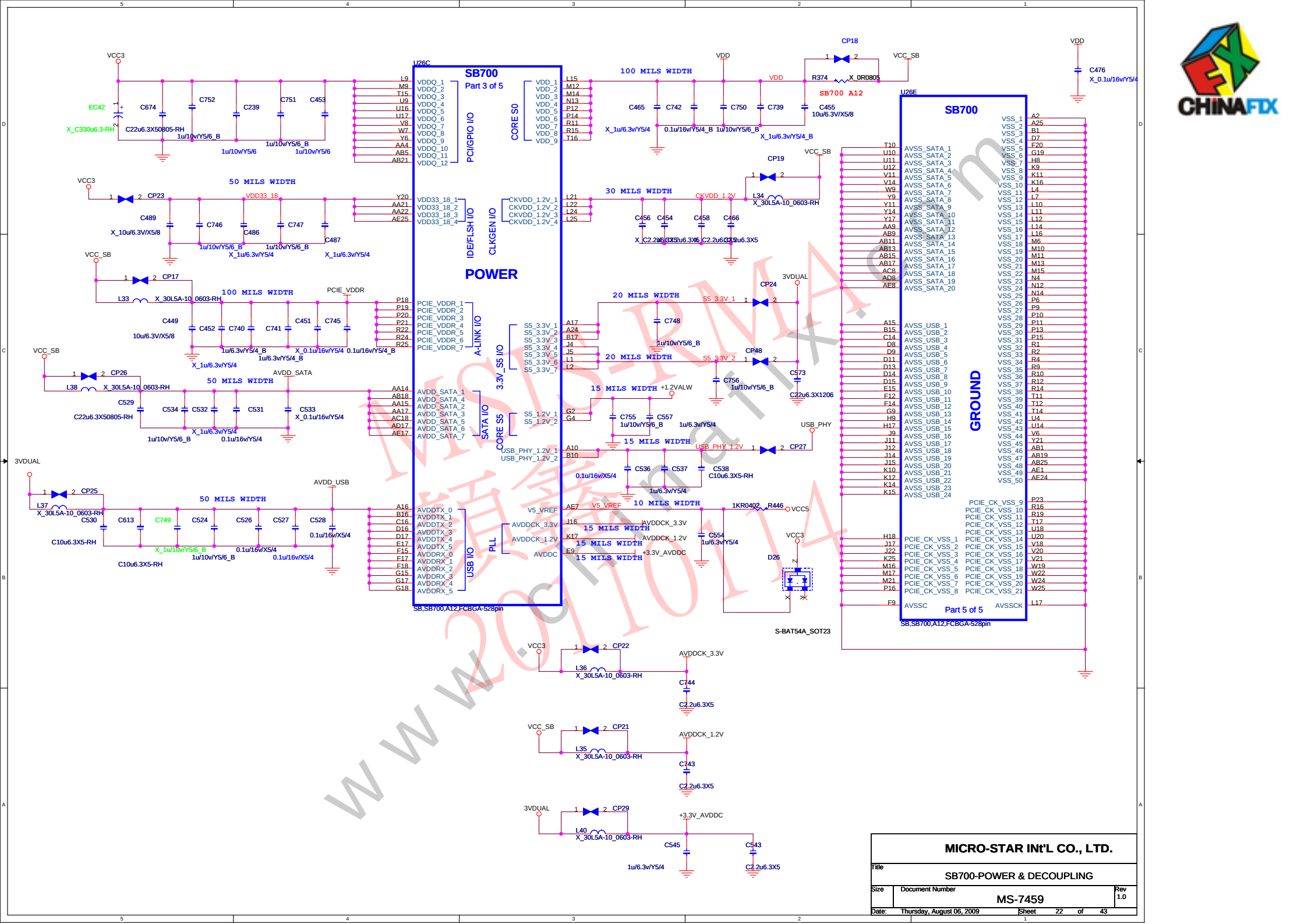

SATA HDD
SATA CDROM/DVD
E-SATA
the signal pairs are not longer than 4-inches.
SATA 90 Ohm
Impedance:
• 90-Ω ± 10% differential
• Reference to a solid GND (not PWR) plane.
N5N-07M0231-H06
R272 IS 1K 1% FOR XTAL,
4.99K 1% FOR INTERNAL CLK
U26B
SB700
Part 2 of 5
SERIAL ATA
ATA 66/100/133
SPI ROM
SATA PWR
HW MONITOR
SB,SB700,A12,FCBGA-528pin
Reserved for EMI 0906
TEMP_COMM
connect to GND
for AMD recommand
SPI FLASH MEMORY
SPI DEBUG PORT
Place close to SPI ROM
SST SPI ROM
W25X80VSSIG
Impedance:SPI
• 60 Ω ± 15%.
• Reference to a solid GND or PWR plane.
CAP CLOSE TO THE BALLS OF SB
CAP CLOSE TO THE BALL OF SB
15 MILS WIDTH
NS_VIA CONNECTS HWM_AGND TO GND
Part Number : N31-2051451-H06
MICRO-STAR INt'L CO., LTD.
SB700-SATA/IDE/HWM/SPI
MS-7459
Thursday, August 06, 2009
Sheet 20 of 43


SB700
Part 4 of 5
U26D
SB700 Pin C8 USBCLK/14M_25M_48M_OSC
Function set output pin by BIOS.
Cap have been unpopulate for meet power sequence
Impedance:USB OC
• 60 Ω ± 15%
• Reference to a GND or PWR plane.
Impedance:HD AUDIO
• 60 Ω ± 15%.
• Reference to a solid GND or PWR plane.
Reserved for EMI 0906
For EMI(closed SB)
Impedance:SMBUS
• 60 Ω ± 15%.
• Reference to a GND or PWR plane.
Impedance:USB RCOMP
• 35 Ω ± 15%
• Reference to the (GND) or USB PWR plane
Added Cap 0.1uF stitching capacitors for crossing a split
90 Ohm
Impedance:USB
• 90-Ω ± 15% differential
• Reference to a solid GND (not PWR) plane.
SB,SB700,A12,FCBGA-528pin
MICRO-STAR INt'L CO., LTD.
SB700-ACPI/GPIO/USB/AUDIO
MS-7459
Thursday, August 06, 2009


SB700
Part 3 of 5
POWER
SB,SB700,A12,FCBGA-528pin
SB700 A12
SB700
Part 5 of 5
GROUND
SB,SB700,A12,FCBGA-528pin
MICRO-STAR INt'L CO., LTD.
SB700-POWER & DECOUPLING
MS-7459
Rev 1.0
Thursday, August 06, 2009
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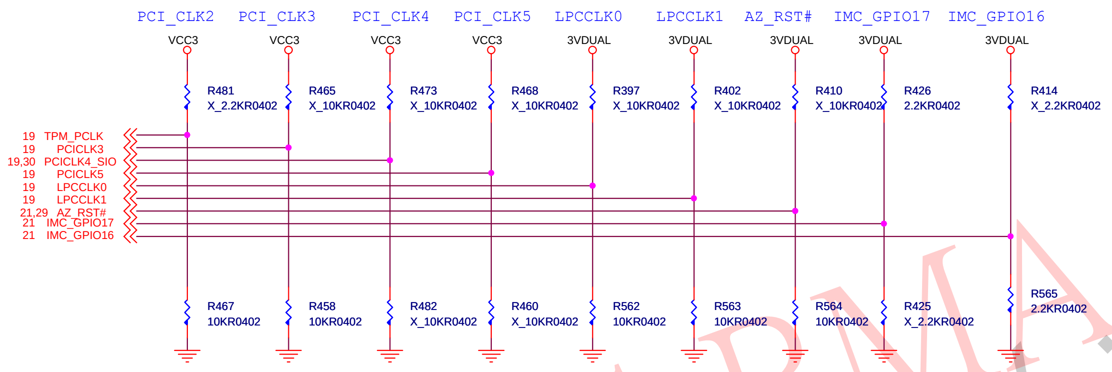
REQUIRED STRAPS

NOTE: SB700 HAS INTERNAL 15K PULL UP RESISTOR FOR RTC_CLK



	PCI_CLK2	PCI_CLK3	PCI_CLK4	PCI_CLK5	LPC_CLK0	LPC_CLK1	AZ_RST#	IMC_GPIO17 IMC_GPIO16
PULL HIGH	WATCHDOG TIMER ON NB_PWRGD ENABLED	USE DEBUG STRAPS	RESERVED	RESERVED	ENABLE PCI MEM BOOT	CLKGEN ENABLED	IMC ENABLED	ROM TYPE: H, H = Reserved H, L = SPI ROM DEFAULT
PULL LOW	WATCHDOG TIMER ON NB_PWRGD DISABLED DEFAULT	IGNORE DEBUG STRAPS DEFAULT			DISABLE PCI MEM BOOT DEFAULT	CLKGEN DISABLED DEFAULT	IMC DISABLED DEFAULT	L, H = LPC ROM L, L = FWH ROM

DEBUG STRAPS

SB700 HAS 15K INTERNAL PU FOR PCI_AD[30:23]

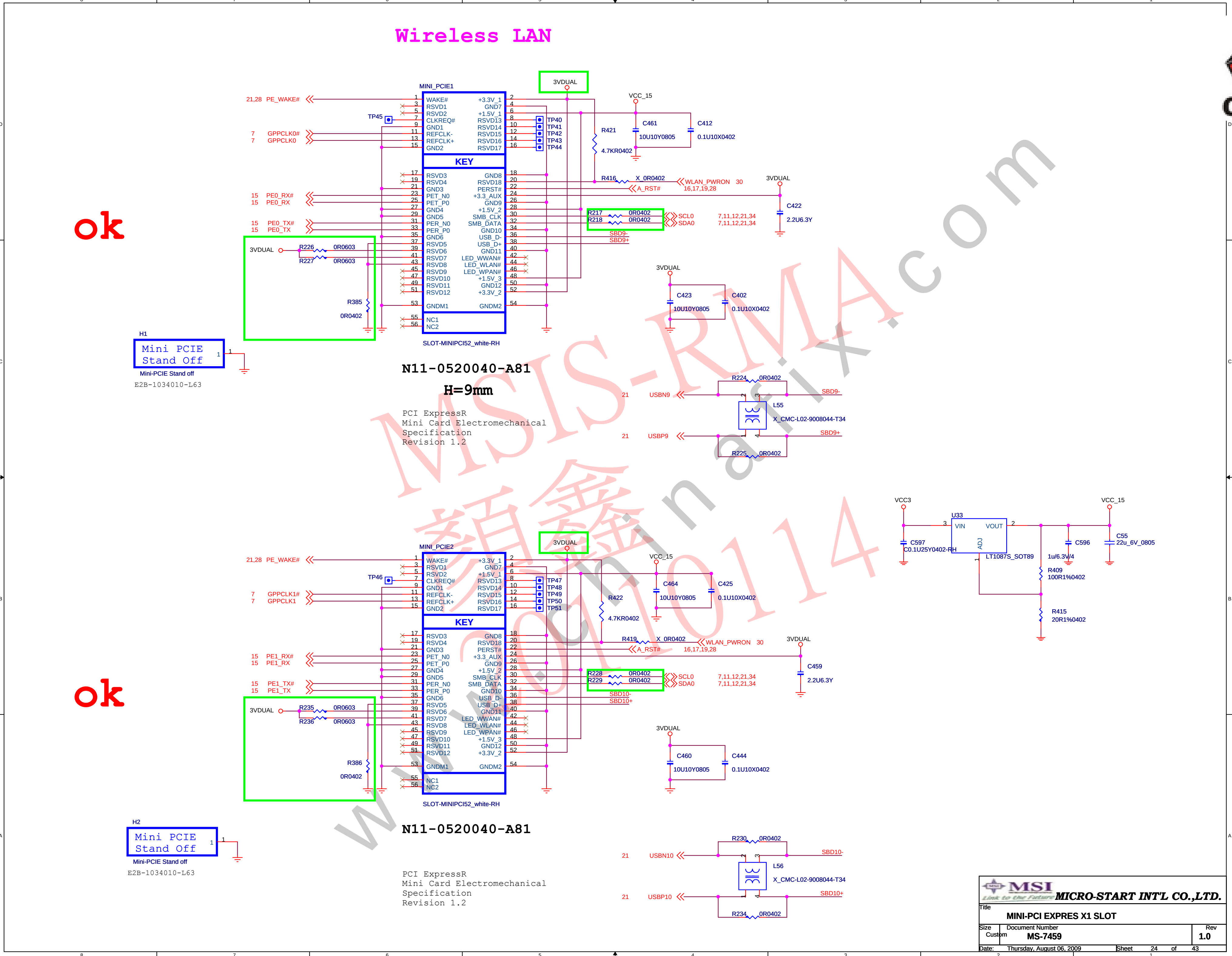
	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	RESERVED
PULL LOW	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	

MICRO-STAR INt'L CO., LTD.

Title: SB700-STRAPS

Size | Document Number: MS-7459 | Rev 1.0

Date: Thursday, August 06, 2009 | Sheet 23 of 43



Wireless LAN
MINI_PCIE1
3VDUAL
VCC_15
21,28 PE_WAKE#
7 GPPCLK0#
7 GPPCLK0
15 PE0_RX#
15 PE0_RX
15 PE0_TX#
15 PE0_TX
TP45
WAKE#
RSVD1
RSVD2
CLKREQ#
GND1
REFCLK-
REFCLK+
GND2
KEY
RSVD3
RSVD4
GND3
PET_N0
PET_P0
GND4
GND5
PER_N0
PER_P0
GND6
RSVD5
RSVD6
RSVD7
RSVD8
RSVD9
RSVD10
RSVD11
RSVD12
GNDM1
NC1
NC2
+3.3V_1
GND7
+1.5V_1
RSVD13
RSVD14
RSVD15
RSVD16
RSVD17
GND8
RSVD18
PERST#
+3.3_AUX
GND9
+1.5V_2
SMB_CLK
SMB_DATA
GND10
USB_D-
USB_D+
GND11
LED_WWAN#
LED_WLAN#
LED_WPAN#
+1.5V_3
GND12
+3.3V_2
GNDM2
TP40
TP41
TP42
TP43
TP44
R421
4.7KR0402
C461
10U10Y0805
C412
0.1U10X0402
R416
X_0R0402
WLAN_PWRON 30
A_RST#
16,17,19,28
C422
2.2U6.3Y
R217
R218
0R0402
SCL0
SDA0
7,11,12,21,34
SBD9-
SBD9+
R226
R227
0R0603
R385
0R0402
C423
10U10Y0805
C402
0.1U10X0402
SLOT-MINIPCI52_white-RH
ok
H1
Mini PCIE Stand Off
Mini-PCIE Stand off
E2B-1034010-L63
N11-0520040-A81
H=9mm
PCI ExpressR Mini Card Electromechanical Specification Revision 1.2
R224
0R0402
21 USBN9
21 USBP9
L55
X_CMC-L02-9008044-T34
R225
VCC3
U33
VIN
VOUT
ADJ
LT1087S_SOT89
C597
C0.1U25Y0402-RH
C596
1u/6.3V/4
C55
22u_6V_0805
R409
100R1%0402
R415
20R1%0402
MINI_PCIE2
21,28 PE_WAKE#
TP46
7 GPPCLK1#
7 GPPCLK1
15 PE1_RX#
15 PE1_RX
15 PE1_TX#
15 PE1_TX
TP47
TP48
TP49
TP50
TP51
R422
4.7KR0402
C464
10U10Y0805
C425
0.1U10X0402
R419
X_0R0402
C459
2.2U6.3Y
R228
R229
SBD10-
SBD10+
R235
R236
R386
C460
10U10Y0805
C444
0.1U10X0402
H2
21 USBN10
21 USBP10
R230
R234
L56
MSI
Link to the Future
MICRO-START INT'L CO.,LTD.
Title
MINI-PCI EXPRES X1 SLOT
Size
Custom
Document Number
MS-7459
Rev
1.0
Date: Thursday, August 06, 2009
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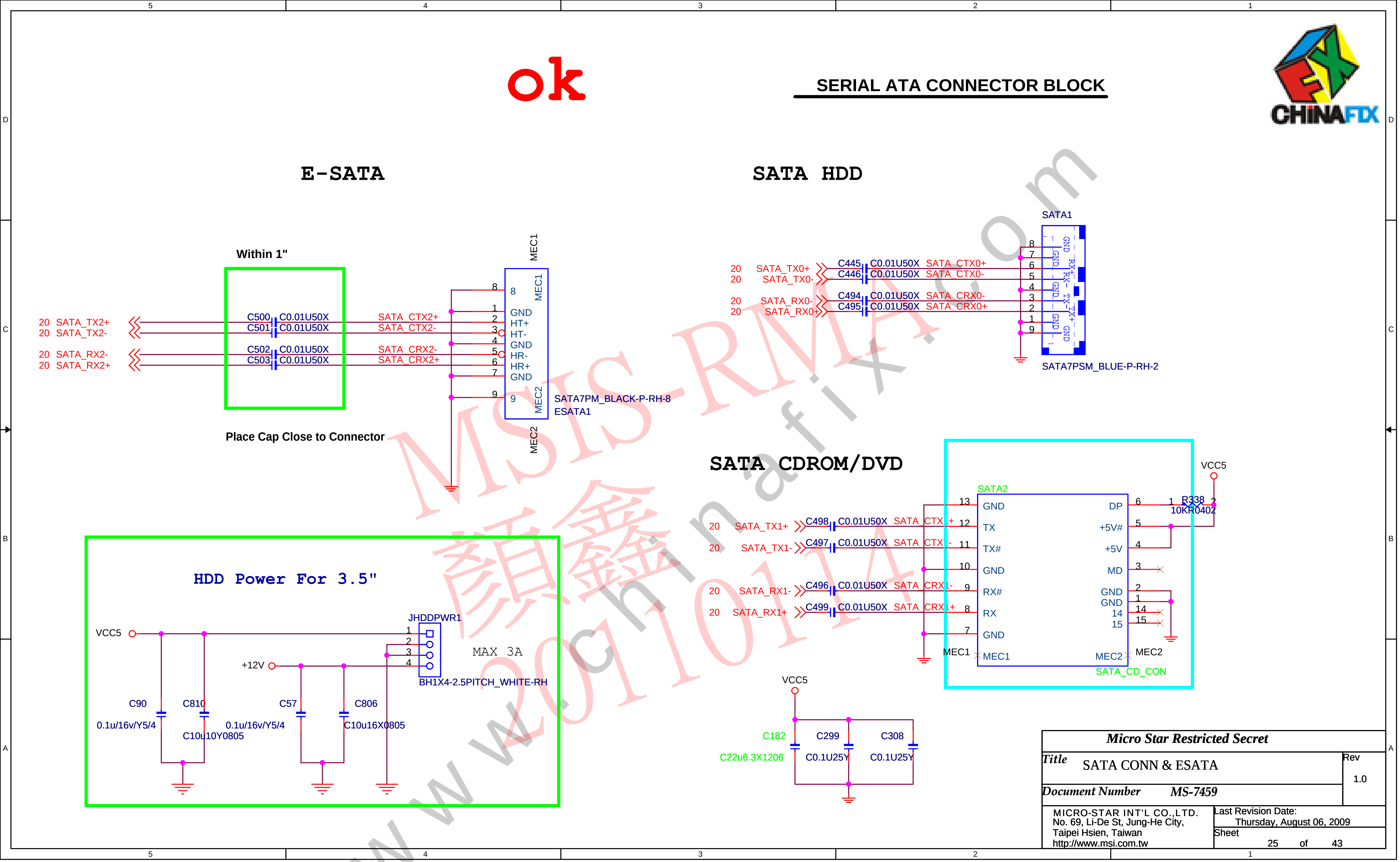
ok
SERIAL ATA CONNECTOR BLOCK
CHINAFIX
E-SATA
SATA HDD
Within 1"
20 SATA_TX2+
20 SATA_TX2-
20 SATA_RX2-
20 SATA_RX2+
C500 C0.01U50X
C501 C0.01U50X
C502 C0.01U50X
C503 C0.01U50X
SATA_CTX2+
SATA_CTX2-
SATA_CRX2-
SATA_CRX2+
MEC1
GND
HT+
HT-
GND
HR-
HR+
GND
MEC2
SATA7PM_BLACK-P-RH-8
ESATA1
Place Cap Close to Connector
SATA1
20 SATA_TX0+
20 SATA_TX0-
20 SATA_RX0-
20 SATA_RX0+
C445 C0.01U50X SATA_CTX0+
C446 C0.01U50X SATA_CTX0-
C494 C0.01U50X SATA_CRX0-
C495 C0.01U50X SATA_CRX0+
SATA7PSM_BLUE-P-RH-2
SATA CDROM/DVD
SATA2
20 SATA_TX1+
20 SATA_TX1-
20 SATA_RX1-
20 SATA_RX1+
C498 C0.01U50X SATA_CTX1+
C497 C0.01U50X SATA_CTX1-
C496 C0.01U50X SATA_CRX1-
C499 C0.01U50X SATA_CRX1+
GND
TX
TX#
GND
RX#
RX
GND
MEC1
DP
+5V#
+5V
MD
GND
GND
MEC2
SATA_CD_CON
VCC5
R338
10KR0402
HDD Power For 3.5"
JHDDPWR1
VCC5
+12V
MAX 3A
BH1X4-2.5PITCH_WHITE-RH
C90 0.1u/16v/Y5/4
C810 C10u10Y0805
C57 0.1u/16v/Y5/4
C806 C10u16X0805
VCC5
C182 C22u6.3X1206
C299 C0.1U25Y
C308 C0.1U25Y
Micro Star Restricted Secret
Title SATA CONN & ESATA
Rev 1.0
Document Number MS-7459
MICRO-STAR INT'L CO.,LTD.
No. 69, Li-De St, Jung-He City,
Taipei Hsien, Taiwan
http://www.msi.com.tw
Last Revision Date: Thursday, August 06, 2009
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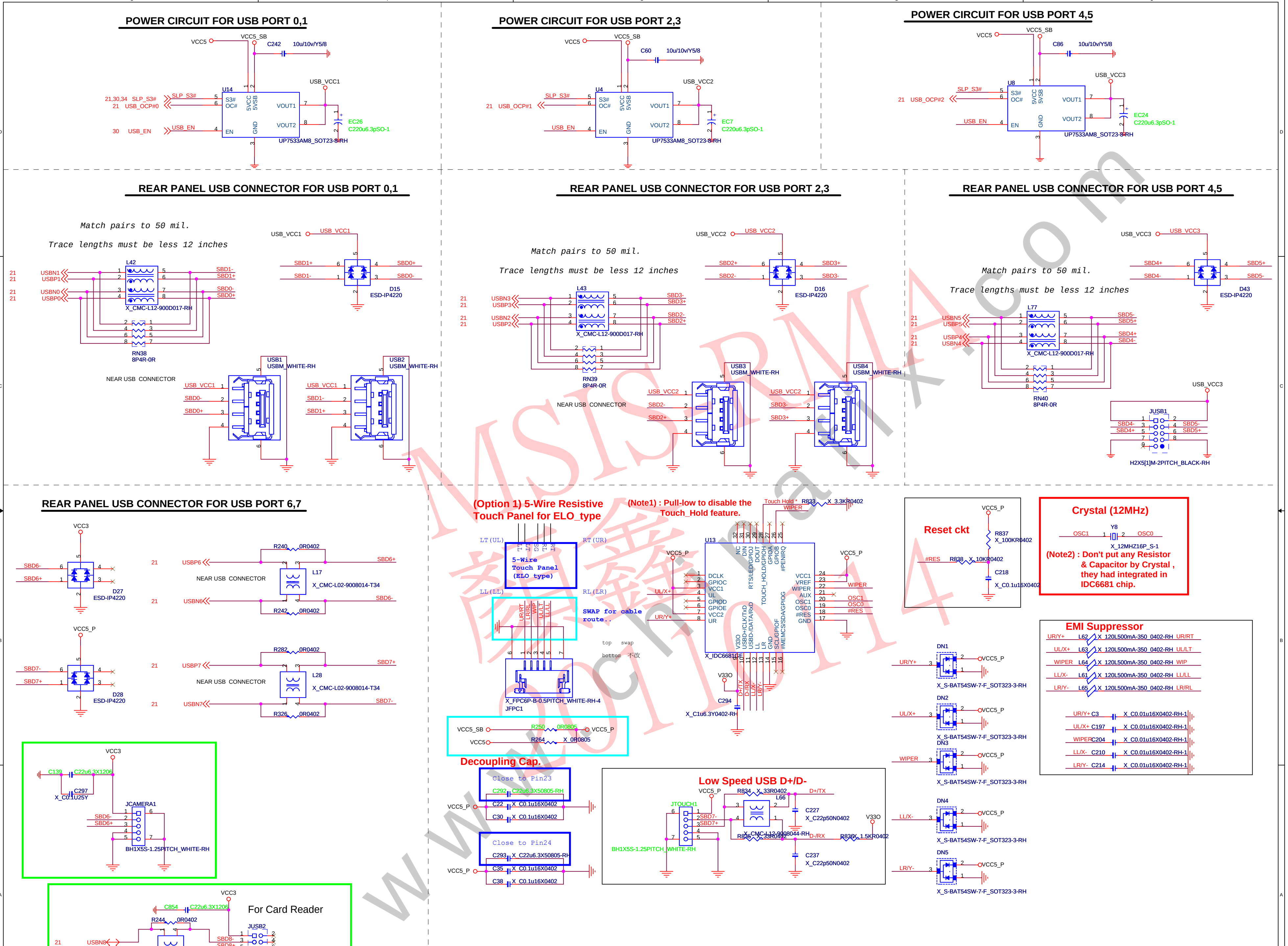

POWER CIRCUIT FOR USB PORT 0,1
POWER CIRCUIT FOR USB PORT 2,3
POWER CIRCUIT FOR USB PORT 4,5
REAR PANEL USB CONNECTOR FOR USB PORT 0,1
REAR PANEL USB CONNECTOR FOR USB PORT 2,3
REAR PANEL USB CONNECTOR FOR USB PORT 4,5
Match pairs to 50 mil.
Trace lengths must be less 12 inches
NEAR USB CONNECTOR
REAR PANEL USB CONNECTOR FOR USB PORT 6,7
(Option 1) 5-Wire Resistive Touch Panel for ELO_type
5-Wire Touch Panel (ELO type)
SWAP for cable route..
(Note1) : Pull-low to disable the Touch_Hold feature.
Reset ckt
Crystal (12MHz)
(Note2) : Don't put any Resistor & Capacitor by Crystal , they had integrated in IDC6681 chip.
EMI Suppressor
Decoupling Cap.
Close to Pin23
Close to Pin24
Low Speed USB D+/D-
For Card Reader

MICRO-STAR INt'L CO., LTD.

Title	USB CONS & CAMERA & TOUCH	
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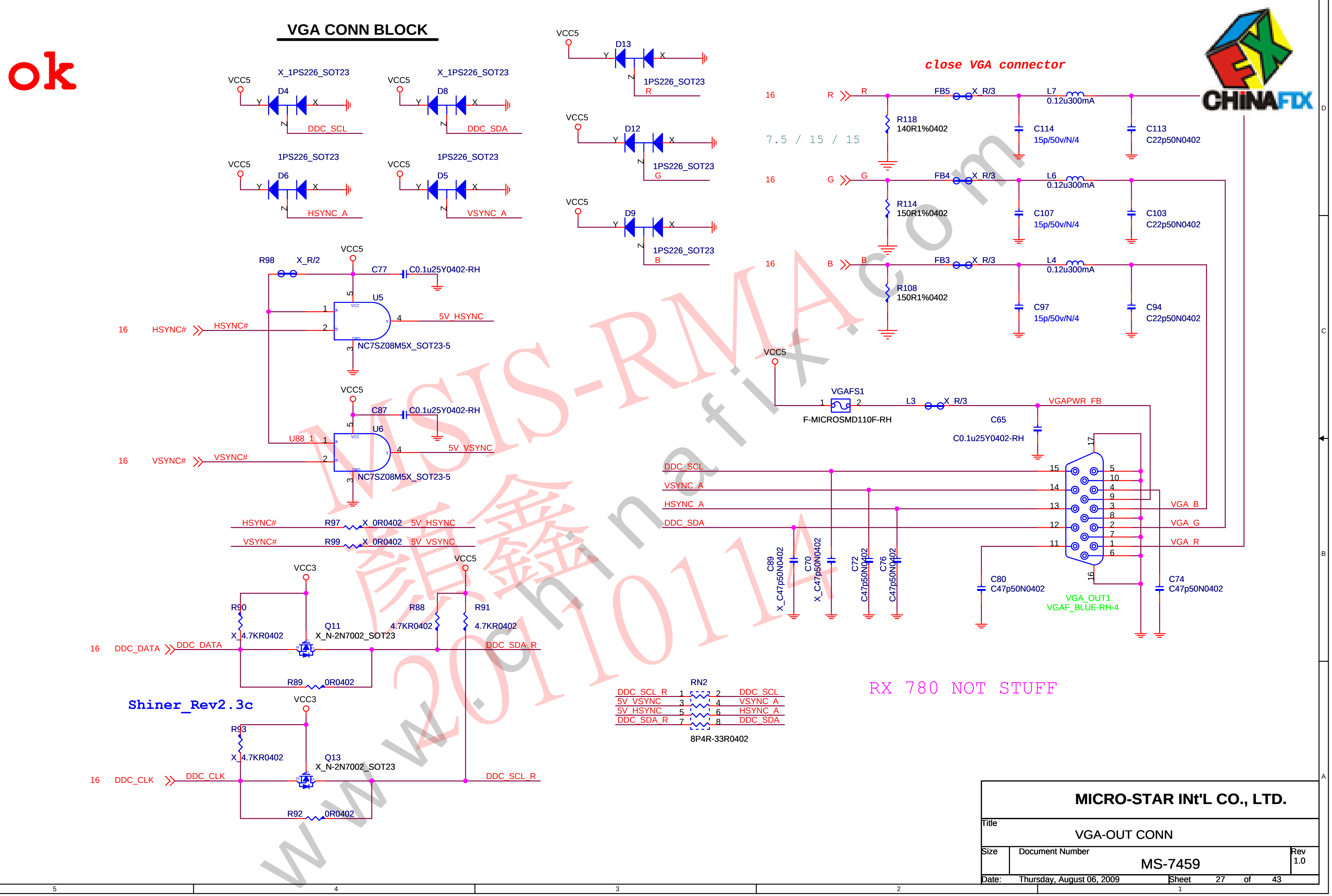

MICRO-STAR INt'L CO., LTD.	
Title	VGA-OUT CONN
Size / Document Number	MS-7459
Rev	1.0
Date:	Thursday, August 06, 2009
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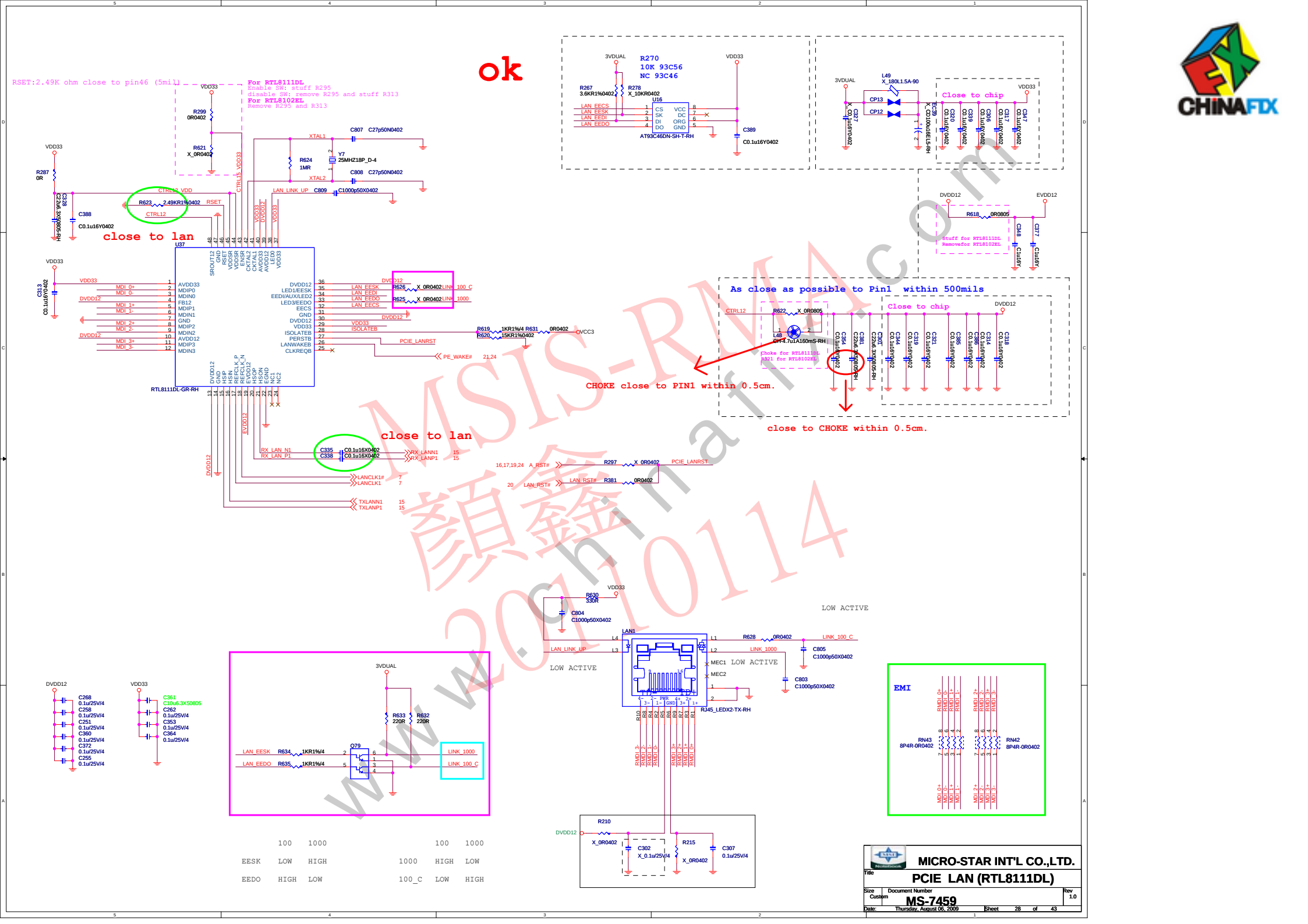
ok
RSET:2.49K ohm close to pin46 (5mil)
For RTL8111DL
Enable SW: stuff R295
disable SW: remove R295 and stuff R313
For RTL8102EL
Remove R295 and R313
close to lan
close to lan
RTL8111DL-GR-RH
CHOKE close to PIN1 within 0.5cm.
close to CHOKE within 0.5cm.
As close as possible to Pin1 within 500mils
Close to chip
Close to chip
R270
10K 93C56
NC 93C46
AT93C46DN-SH-T-RH
LOW ACTIVE
LOW ACTIVE
LOW ACTIVE
RJ45_LEDX2-TX-RH
EMI
RN43
8P4R-0R0402
RN42
8P4R-0R0402
Stuff for RTL8111DL
Removefor RTL8102EL
Choke for RTL8111DL
R321 for RTL8102EL
100 1000
EESK LOW HIGH
EEDO HIGH LOW
100 1000
1000 HIGH LOW
100_C LOW HIGH
MICRO-STAR INT'L CO.,LTD.
PCIE LAN (RTL8111DL)
MS-7459
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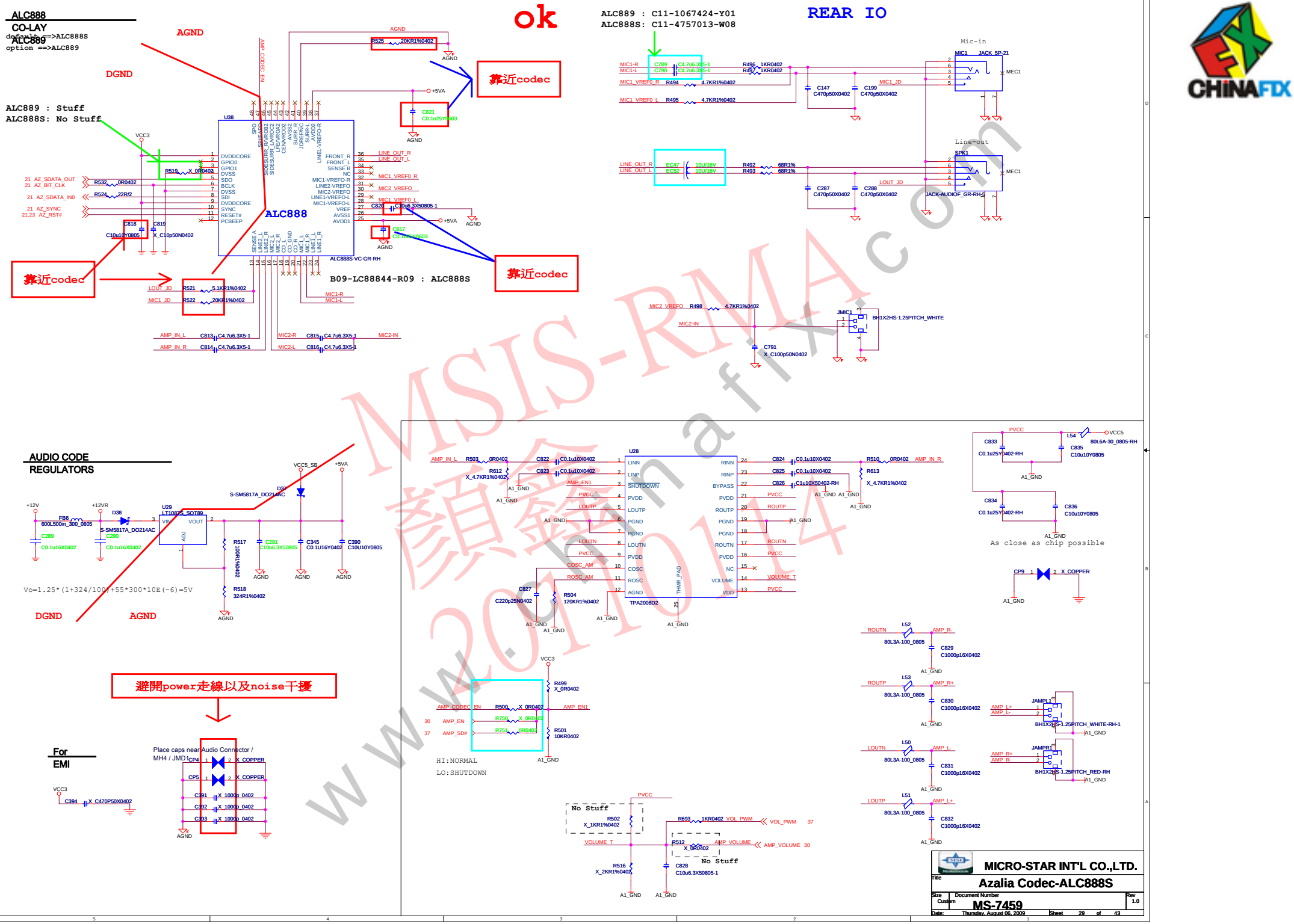
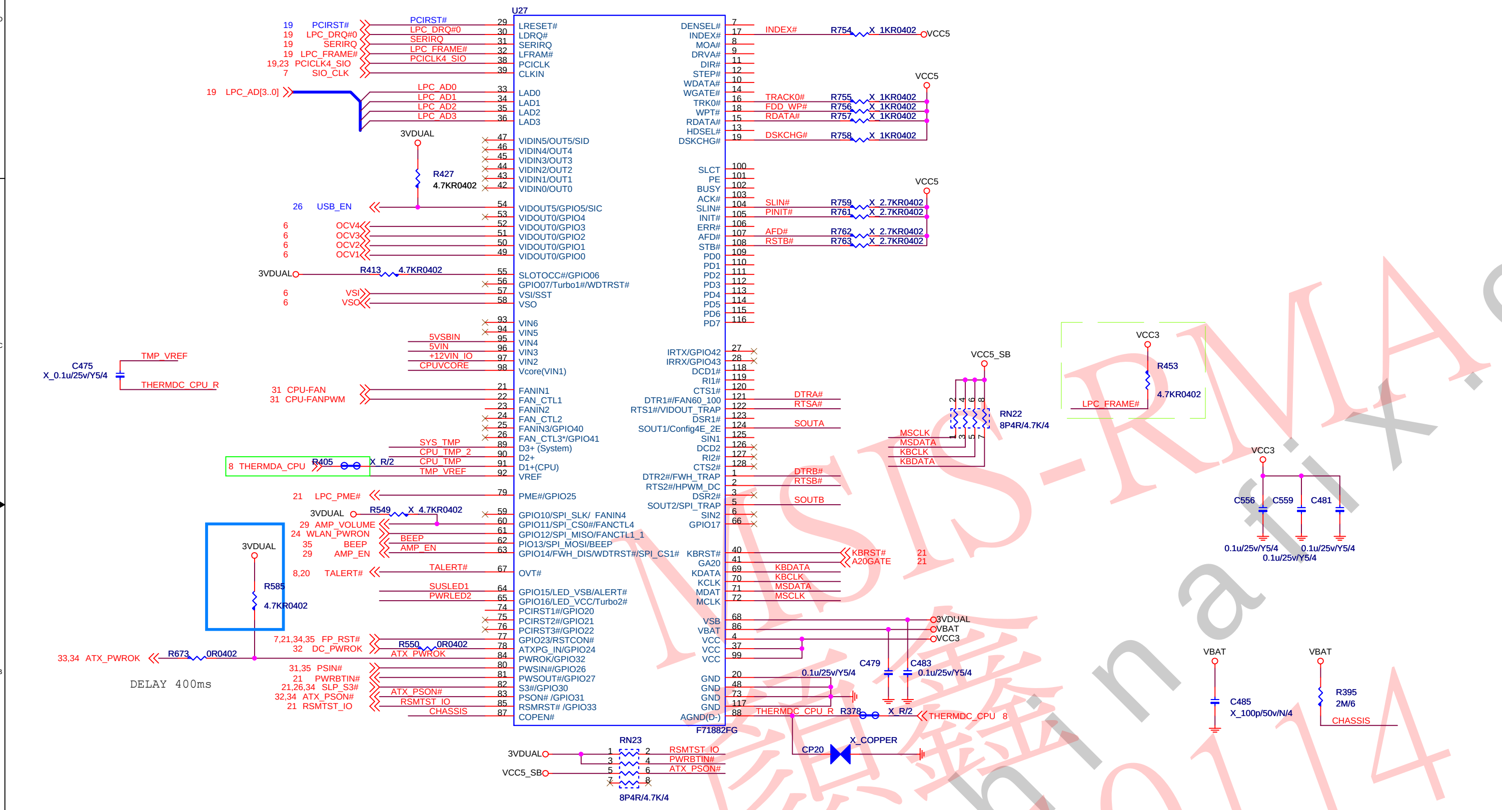
1.0

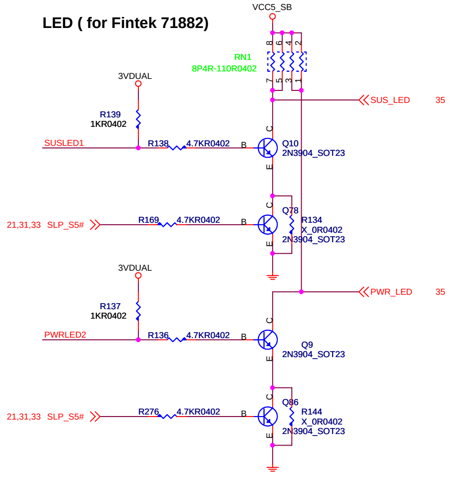

ALC888
CO-LAY
default ==>ALC888S
ALC889
option ==>ALC889
ok
ALC889 : C11-1067424-Y01
ALC888S: C11-4757013-W08
REAR IO
AGND
DGND
ALC889 : Stuff
ALC888S: No Stuff
靠近codec
ALC888
ALC888S-VC-GR-RH
B09-LC88844-R09 : ALC888S
Mic-in
Line-out
JACK_5P-21
JACK-AUDIOF_GR-RH-5
BH1X2HS-1.25PITCH_WHITE
AUDIO CODE
REGULATORS
S-SM5817A_DO214AC
LT1962S_SOT89
Vo=1.25*(1+324/100)+55*300*10E(-6)=5V
TPA2008D2
HI:NORMAL
LO:SHUTDOWN
As close as chip possible
避開power走線以及noise干擾
For
EMI
Place caps near Audio Connector /
MH4 / JMD1
No Stuff
MICRO-STAR INT'L CO.,LTD.
Azalia Codec-ALC888S
MS-7459
Thursday, August 06, 2009

Super I/O

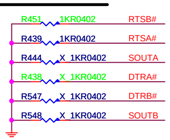
LPC SUPER I/O F71882



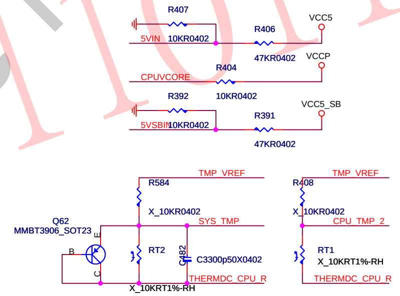
LED (for Fintek 71882)



LPC I/O STRAPPING RESISTOR

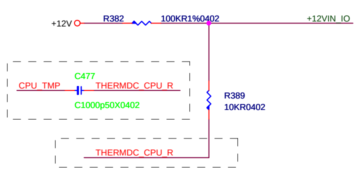


	Don't STUFF	STUFF
RTSB#	PWM FAN	LINEAR FAN
RTSA#	PIN49-54=VID_OUT PIN42-47=VIDIN	PIN49-54=GPIO PIN42-47=VIDIN/OUT
SOUTA	4E	2E
DTRA#	FAN START DUTY 60%	FAN START DUTY 100%
DTRB#	SPI as a backup BIOS	SPI as a primary BIOS
SOUTB	SPI function disable	SPI function enable



NOTE: LOCATE CLOSE STATUS PANEL

Thermal Resistor



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Title: LPC-F71882

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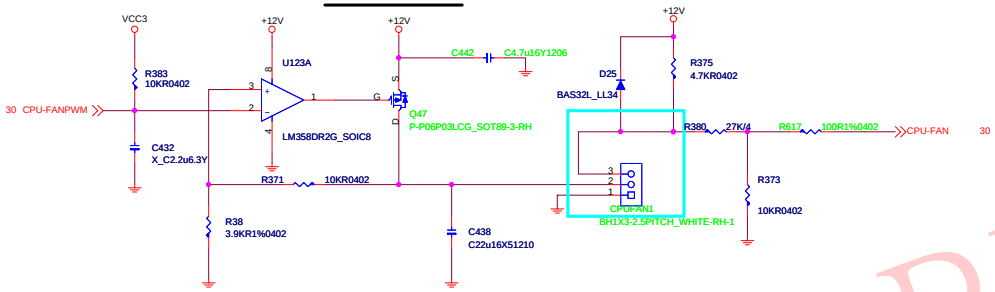
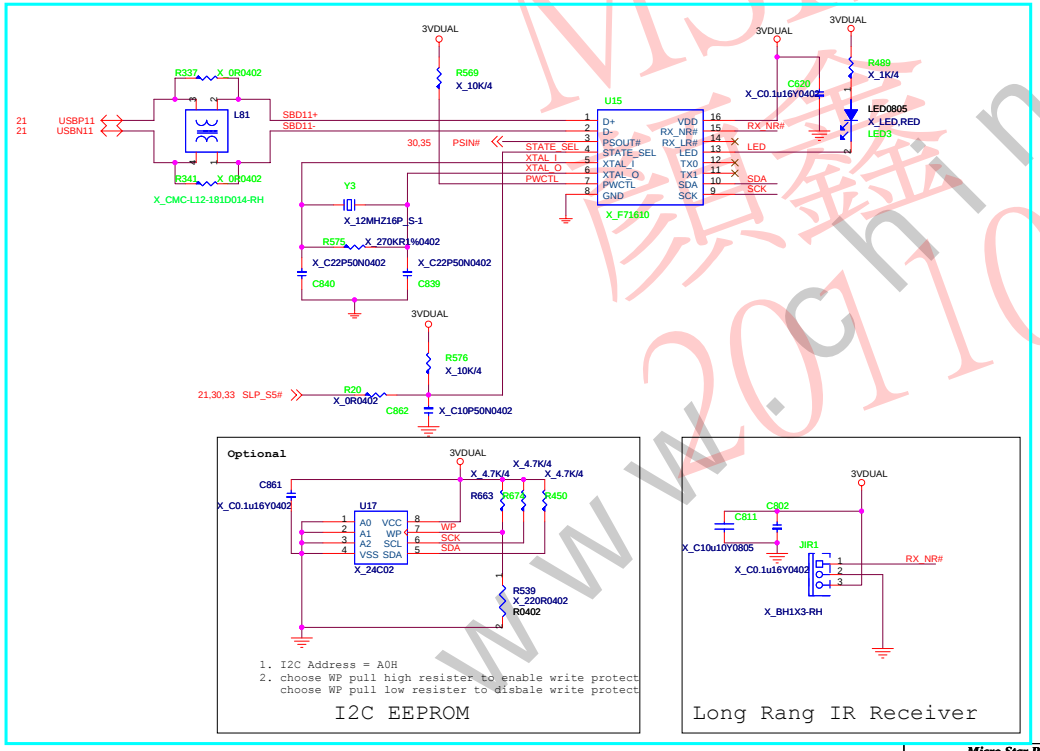
FAN CONTROL

DC MODE

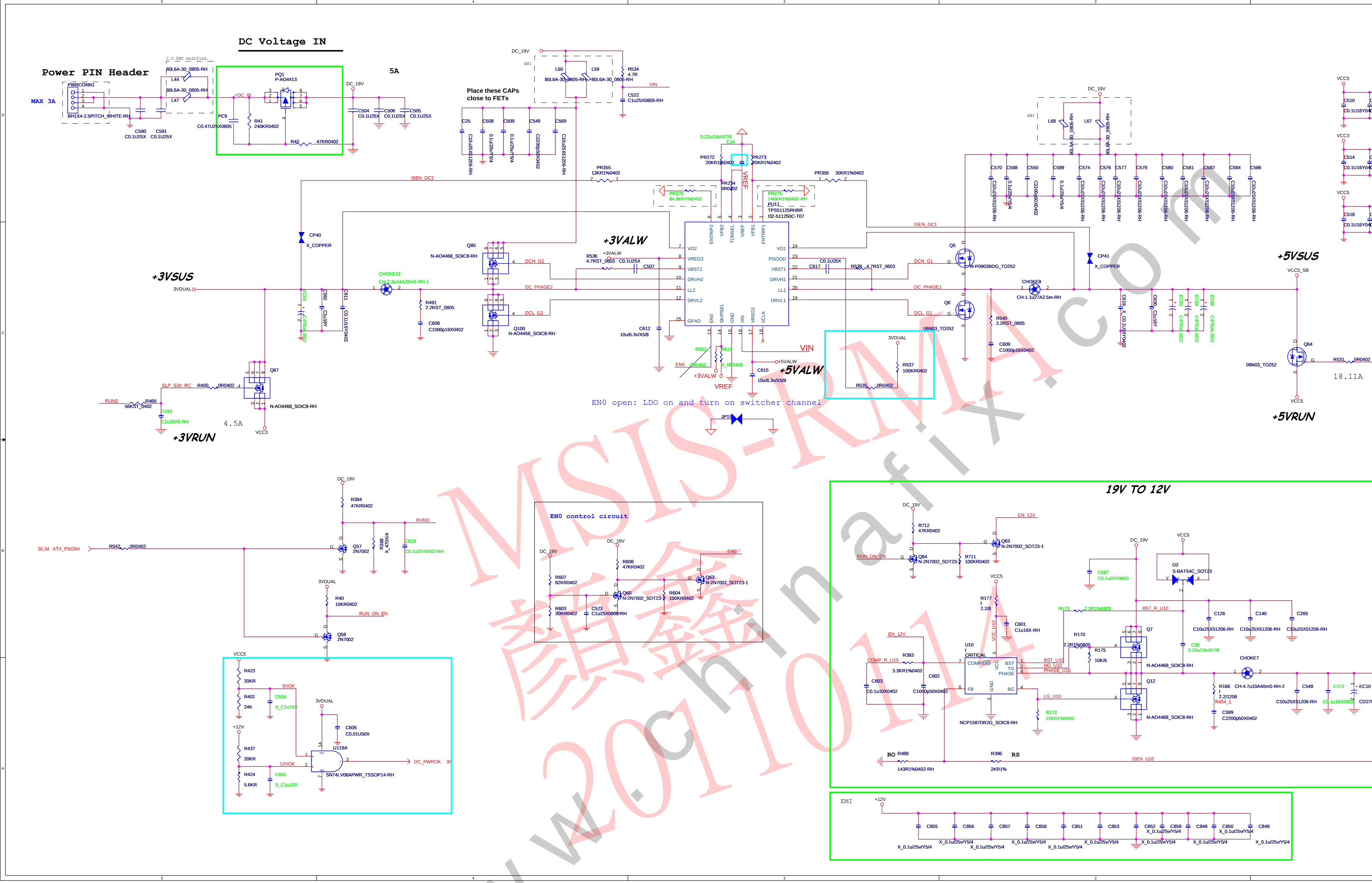
ok

CPU FAN





Micro Star Restricted Secret		
Title: FAN & IR		Rev: 1.0
Document Number: MS-7459		
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Thursday, August 06, 2009	Sheet 31 of 43



MICRO-STAR INT'L CO.,LTD.

Title: DC IN POWER & +12V

Size: Custom | Document Number: MS-7459 | Rev: 1.0

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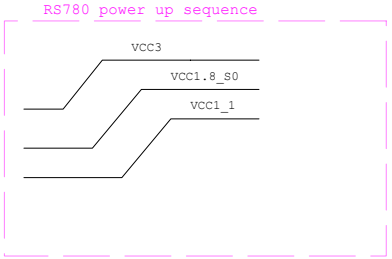

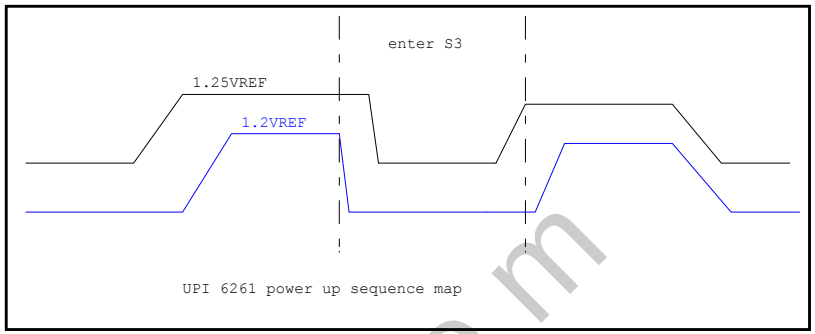

NB 1.1V POWER

VCC1_1 10.2A

Vout=1.1(16.2+3.01)/16.2=1.304

Choke10 & Choke11
del AVL : L04-11A7031-T15

DDR II 1.8V POWER

VCC_DDR 9.5A

1.9 * 25 = 47.5

2.8 * 25 = 70

DDR VTT Power

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

VTT_DDR 1.5A

1.25v/2.9A

Micro Star Restricted Secret	
Title	VCC_DDR & VCC1_1 NB
Rev	1.0
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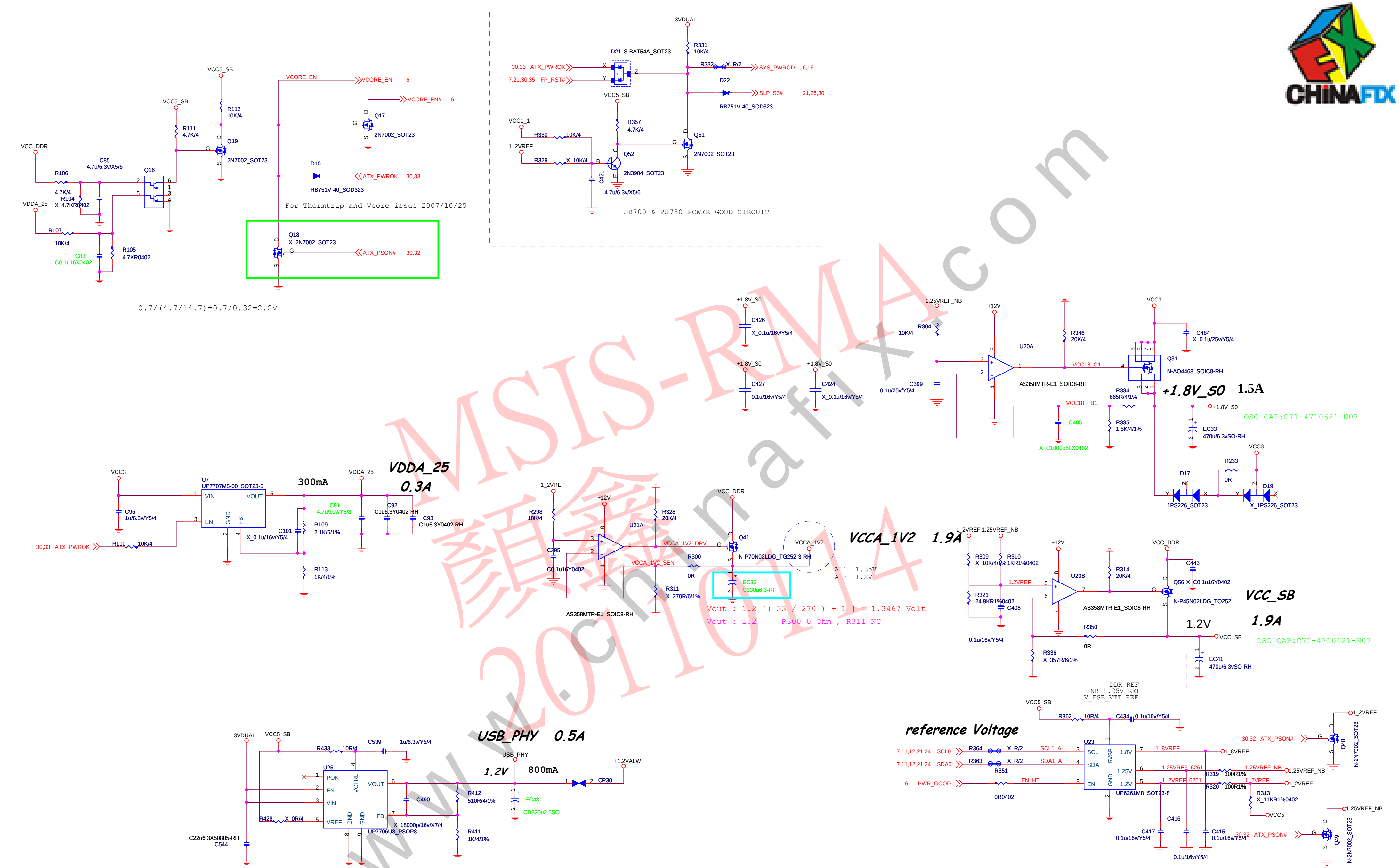

Micro Star Restricted Secret

Title	ACPI BY UPI	Rev 1.0
Document Number	MS-7459	
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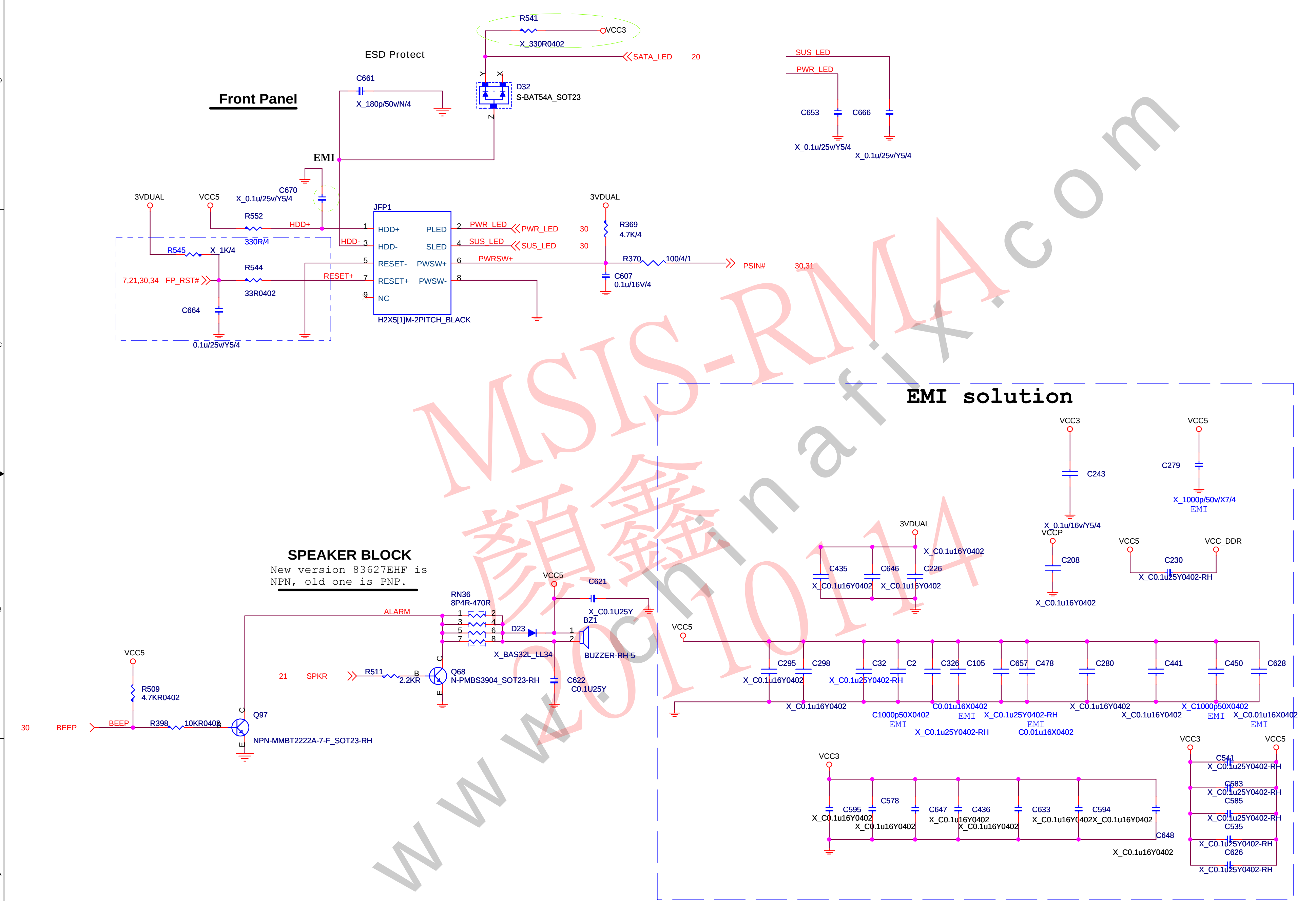

Micro Star Restricted Secret		
Title *Front Panel/EMI*		Rev 1.0
Document Number *MS-7459*		
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Thursday, August 06, 2009	
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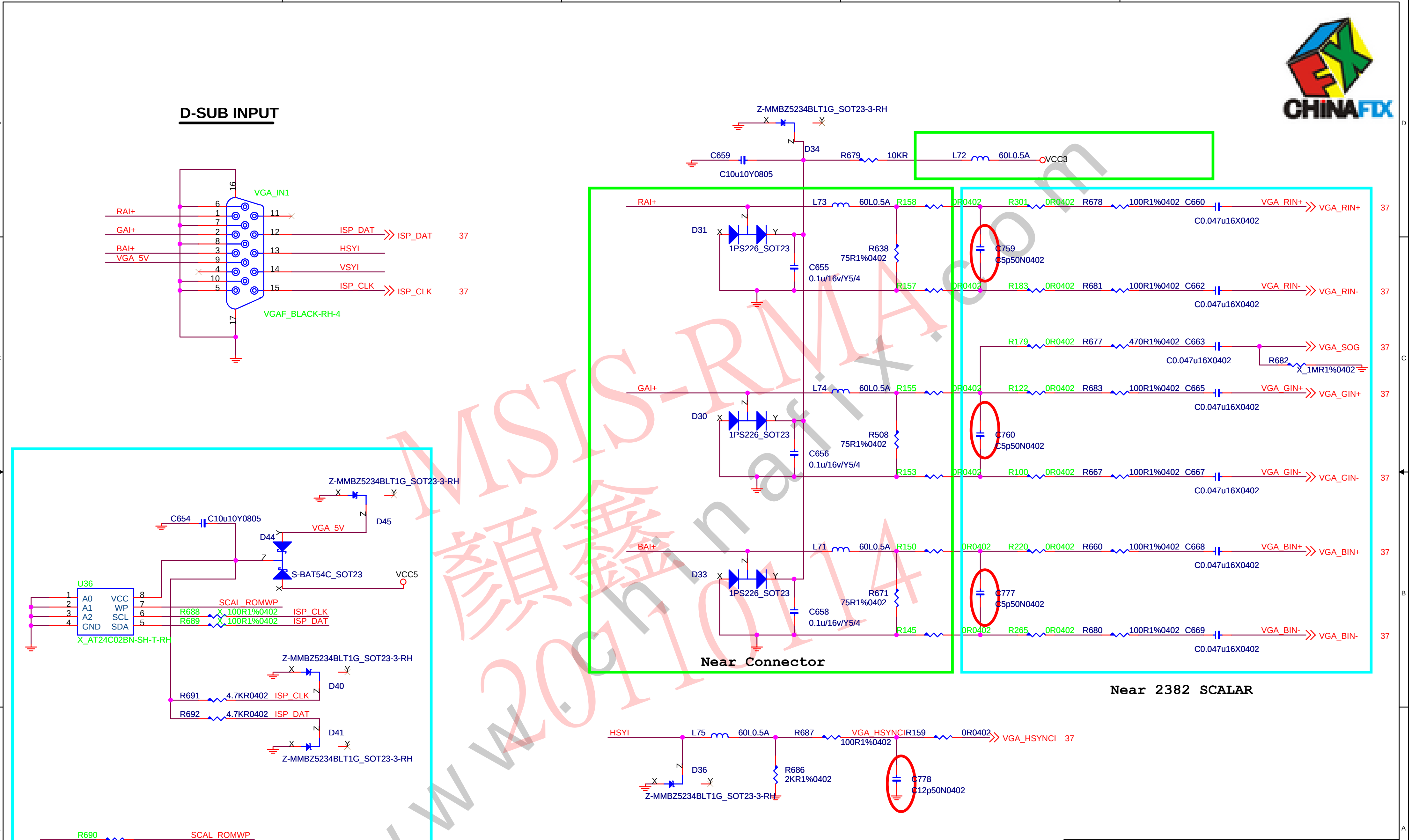

MICRO-STAR INT'L CO.,LTD.

Title: SCALER(VGA IN)

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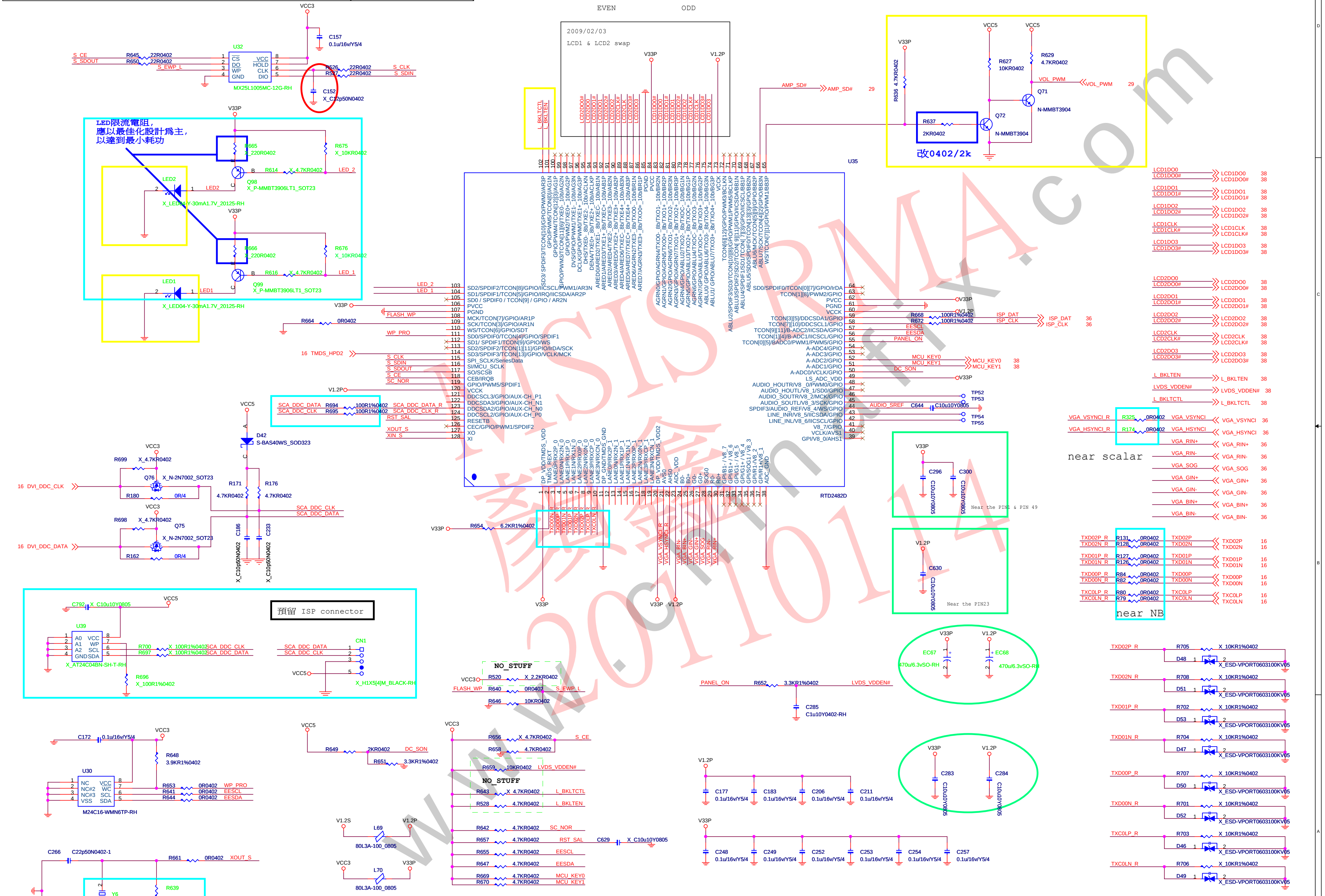
		UNIT
V_{DD}, PV_{DD}	Supply voltage range	-0.3 V to 6 V
V_I (RINN, RINP, LINN, LINP, VOLUME)	Input voltage range	0 V to V_{DD}
	Continuous total power dissipation	See Dissipation Rating Table
T_A	Operating free-air temperature range	-40°C to 85°C
T_J	Operating junction temperature range	-40°C to 150°C
T_{stg}	Storage temperature range	-65°C to 85°C
	Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C

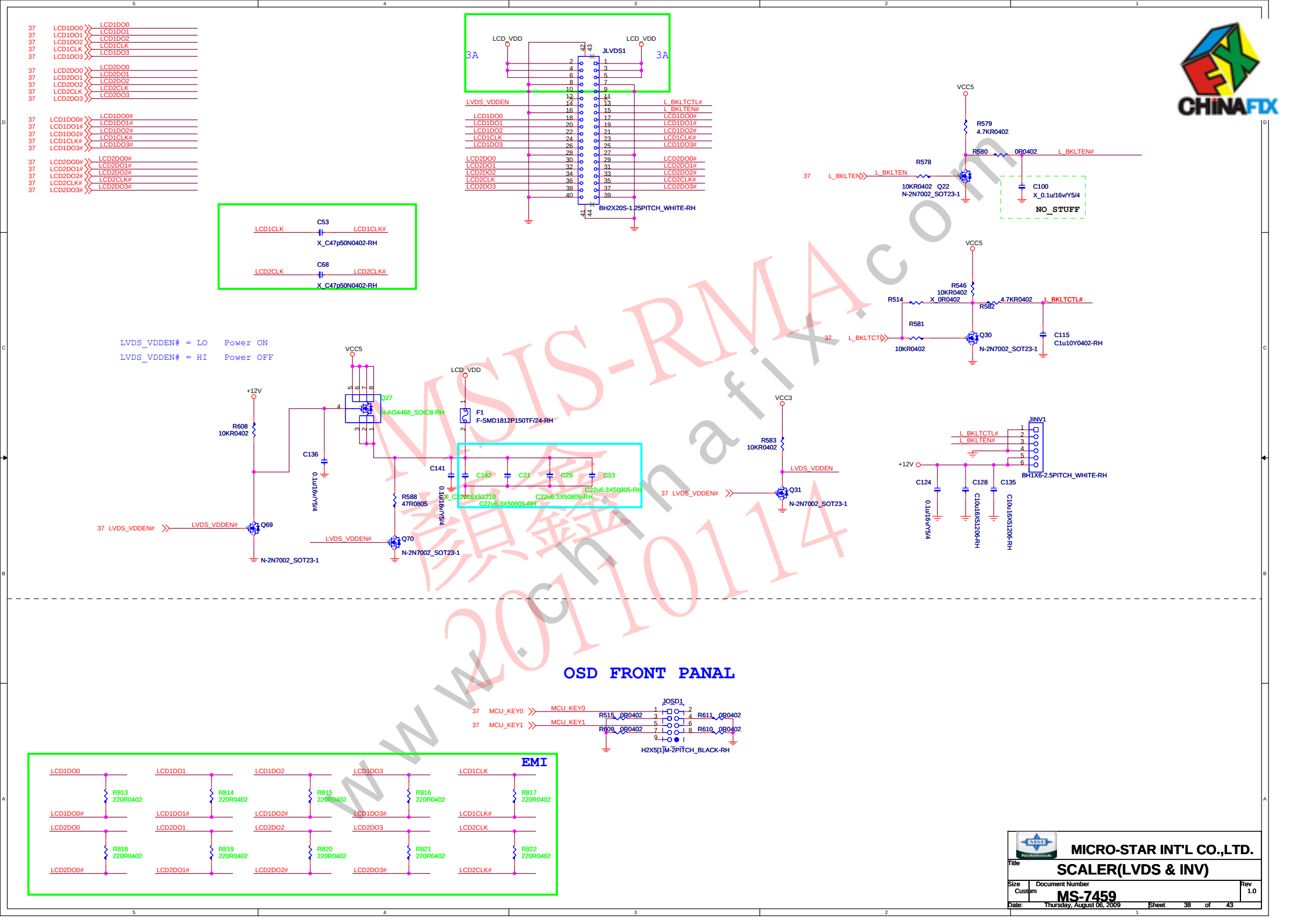


MICRO-STAR INT'L CO.,LTD.

Title: SCALER(MAIN)

Size: Custom | Document Number: MS-7459 | Rev: 1.0

Date: Thursday, August 06, 2009 | Sheet 37 of 43



MICRO-STAR INT'L CO.,LTD.

Title: SCALER(LVDS & INV)

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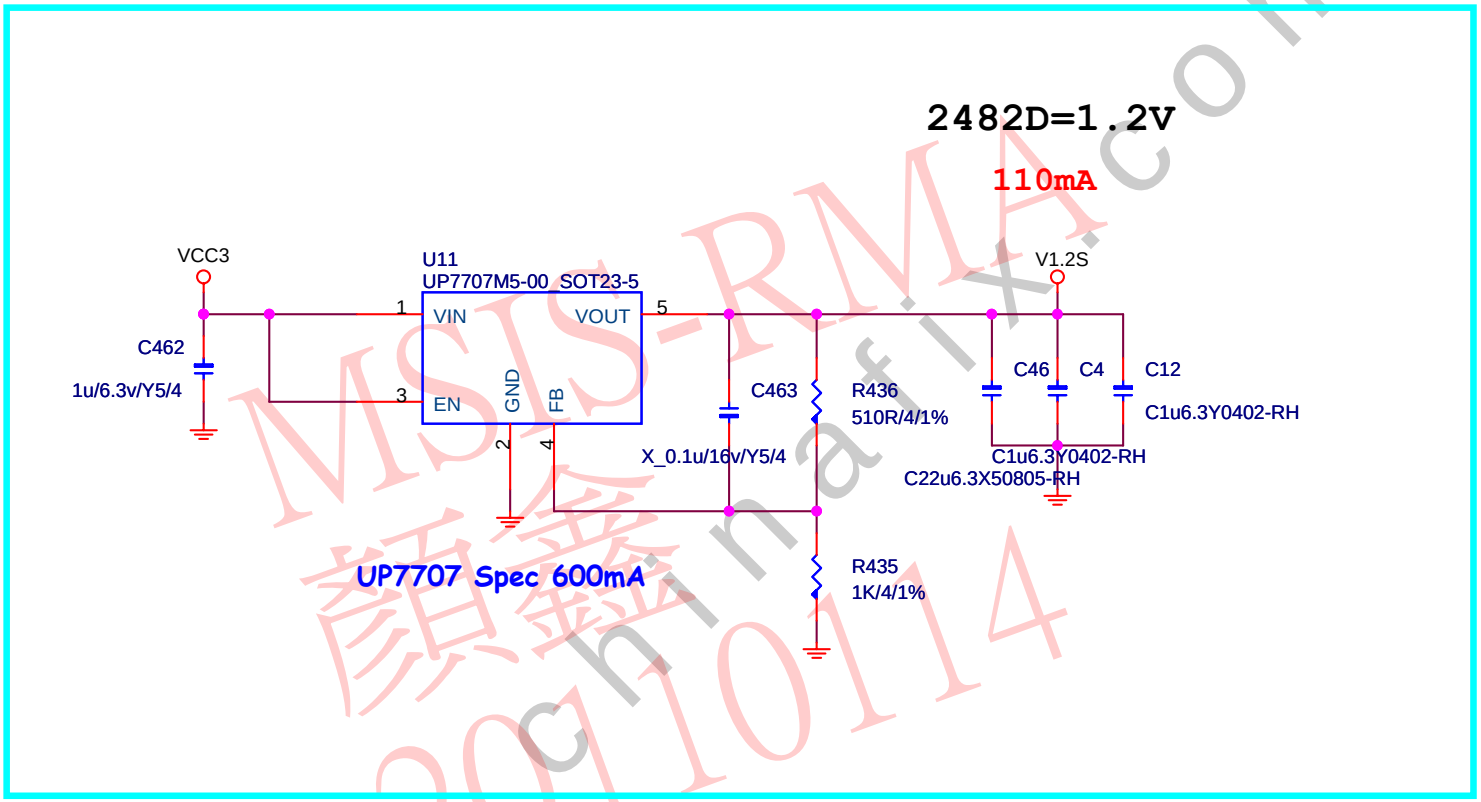

MICRO-STAR INT'L CO.,LTD.

Title: SCALER(POWER)

Size	Document Number	Rev
A	MS-7459	1.0

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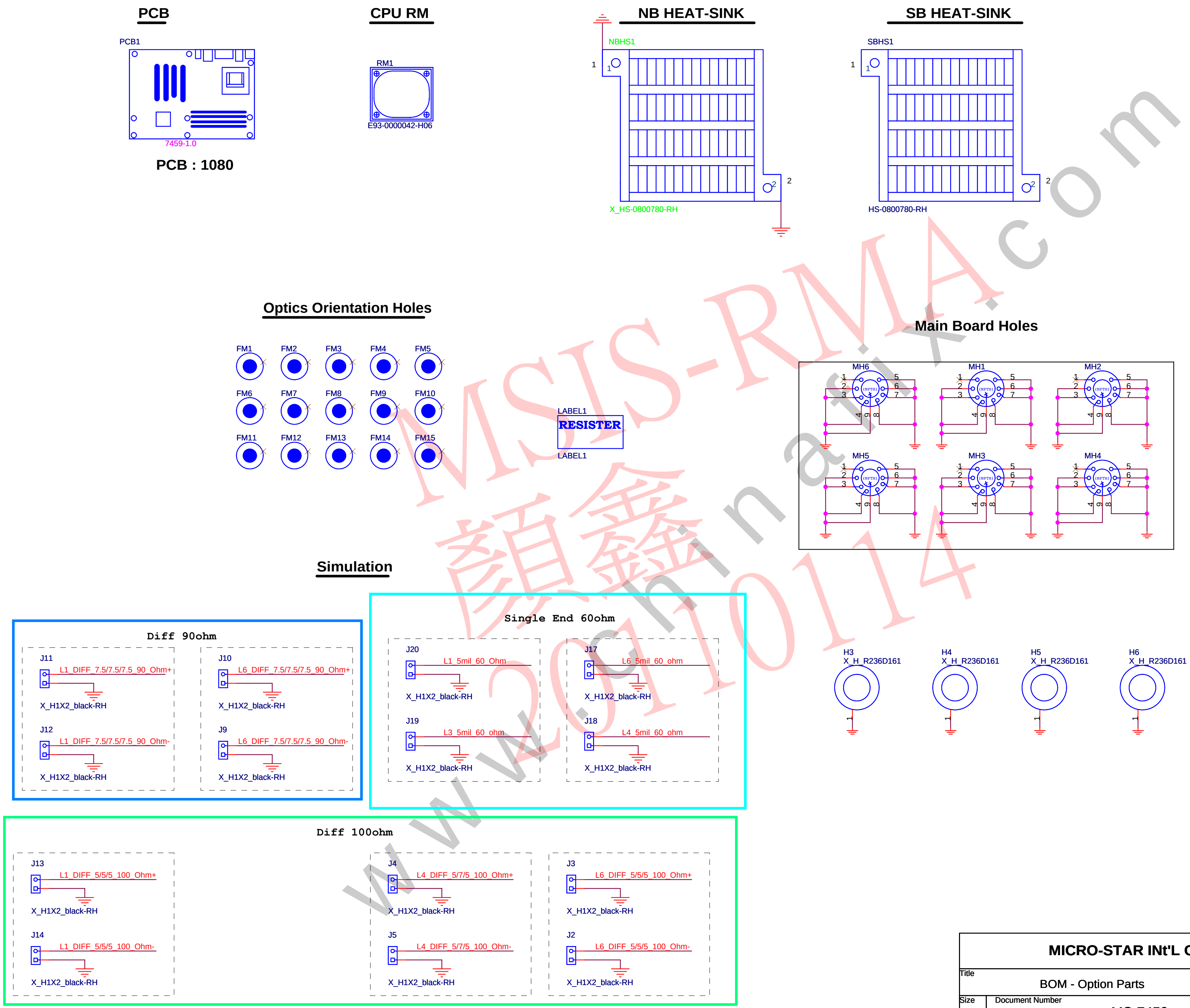
PCB
PCB1
7459-1.0
PCB : 1080
CPU RM
RM1
E93-0000042-H06
NB HEAT-SINK
NBHS1
X_HS-0800780-RH
SB HEAT-SINK
SBHS1
HS-0800780-RH
Optics Orientation Holes
FM1 FM2 FM3 FM4 FM5
FM6 FM7 FM8 FM9 FM10
FM11 FM12 FM13 FM14 FM15
LABEL1
RESISTER
Main Board Holes
MH6 MH1 MH2
MH5 MH3 MH4
H3 X_H_R236D161
H4 X_H_R236D161
H5 X_H_R236D161
H6 X_H_R236D161
Simulation
Diff 90ohm
J11 L1_DIFF_7.5/7.5/7.5_90_Ohm+ X_H1X2_black-RH
J12 L1_DIFF_7.5/7.5/7.5_90_Ohm- X_H1X2_black-RH
J10 L6_DIFF_7.5/7.5/7.5_90_Ohm+ X_H1X2_black-RH
J9 L6_DIFF_7.5/7.5/7.5_90_Ohm- X_H1X2_black-RH
Single End 60ohm
J20 L1_5mil_60_Ohm X_H1X2_black-RH
J19 L3_5mil_60_ohm X_H1X2_black-RH
J17 L6_5mil_60_ohm X_H1X2_black-RH
J18 L4_5mil_60_ohm X_H1X2_black-RH
Diff 100ohm
J13 L1_DIFF_5/5/5_100_Ohm+ X_H1X2_black-RH
J14 L1_DIFF_5/5/5_100_Ohm- X_H1X2_black-RH
J4 L4_DIFF_5/7/5_100_Ohm+ X_H1X2_black-RH
J5 L4_DIFF_5/7/5_100_Ohm- X_H1X2_black-RH
J3 L6_DIFF_5/5/5_100_Ohm+ X_H1X2_black-RH
J2 L6_DIFF_5/5/5_100_Ohm- X_H1X2_black-RH

MICRO-STAR INt'L CO., LTD.	
Title	BOM - Option Parts
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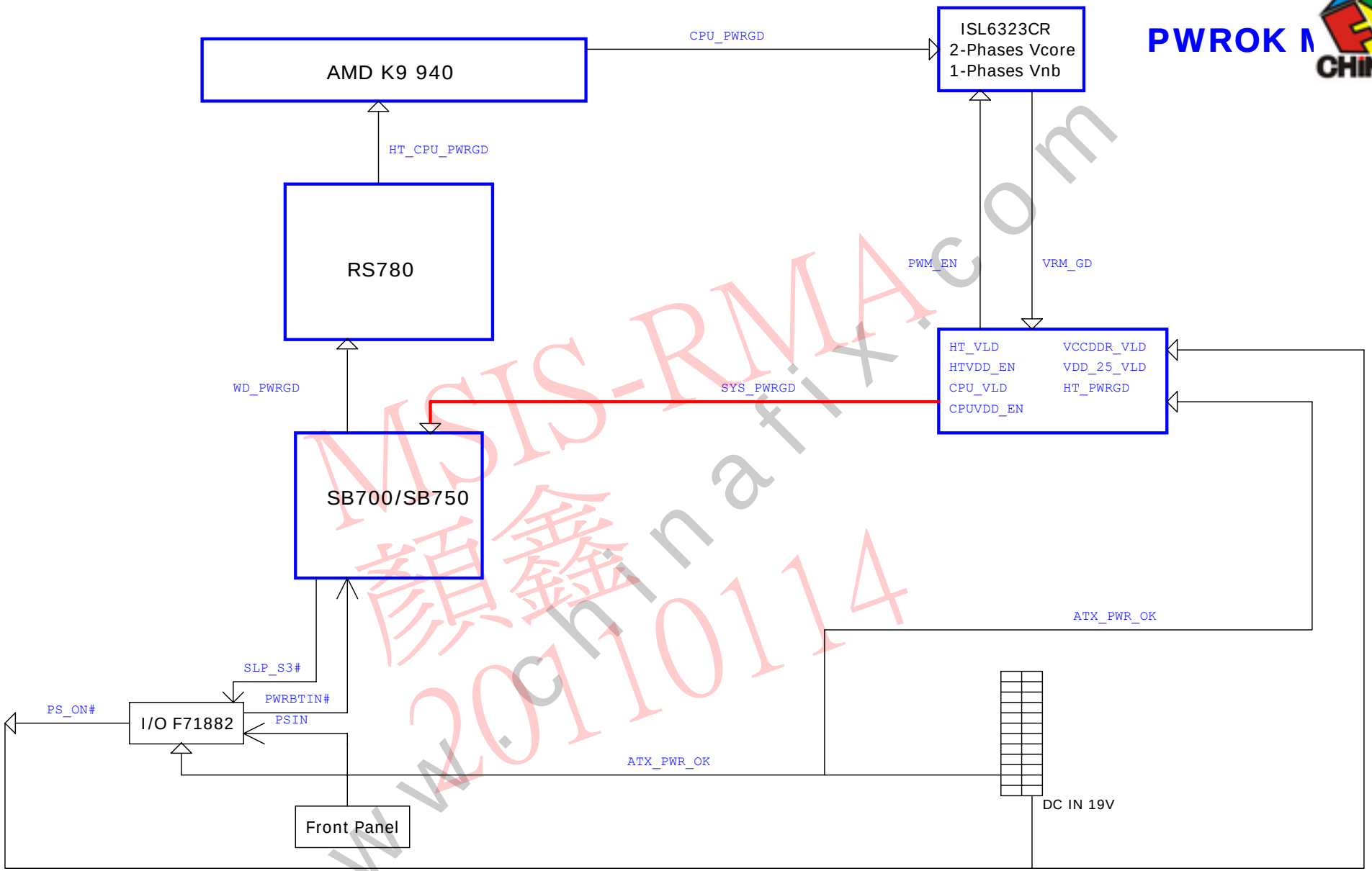
PWROK M



MSI	MICRO-STAR INt'L CO., LTD.	
Title	PWROK MAP	
Size	Document Number MS-7459	Rev 1.0
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MS-7459 0A change 1.0

1.Lan LED reverse.
2.change U32 to M31-25L1002-M24
3.fan connector 1 and 3 pin reverse and add R617 預防逆電流.
4.Remove C6 解不上CPU電壓會不正常切換.
5.sata2 connector 換料.
6.remove R250 staff R264解touch ic s3 resume no power issue.
7.將U14&U4&U8 pin5改接SLP_S3#.
8.remove DC-POWER OK CIRCUIT.
9.change EC46,EC32,EC47,EC52,EC25,C142,C182,Q47,Q47,Y6 COST DOWN.
10.modify ISP_CLK & ISP_DATA.
11.change CN1 & HDMI -IN signal & SCALAR IC 2382

Micro Star Restricted Secret		
Title	*HISTORY*	Rev 1.0
Document Number	*MS-7459*	
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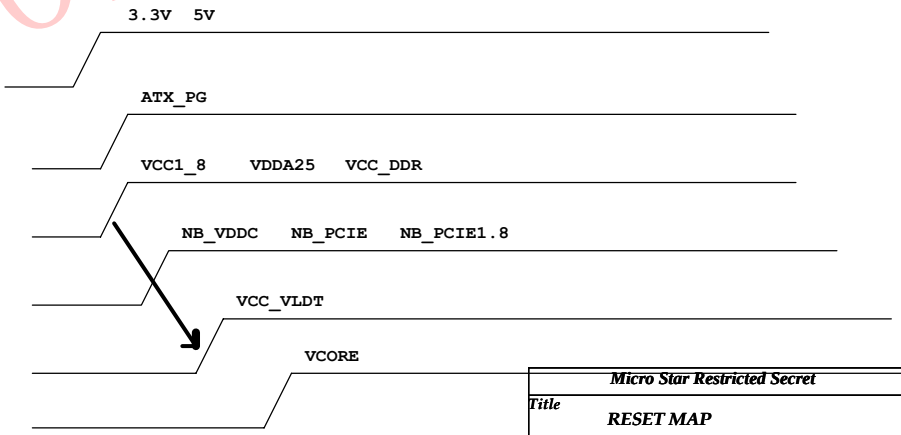

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Title	*RESET MAP*
Document Number	*MS-7459*
Rev	1.0

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Taipei Hsien, Taiwan
http://www.msi.com.tw

Last Revision Date: Thursday, August 06, 2009

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