

MS-7356 Ver : 11

Intel (R) LGA775 Processor
Intel (R) Bearlake (GMCH) + ICH9/ICH9R Chipset



- CPU:**
- Intel - Conroe 2.66G (E6750)

Intel - Prescott 3.73G (P4-EE-3.73GHz)
- Intel - Presler 3.73G (PentiumEE965)

Intel - CedarMill 3.73G (Celeron D356)
- Intel - SmithField 3.2G (Pentium EE840)

Intel - Gallatin 3.46G (P4-EE-3.46GHz)
- Intel - Kentsfield (Q6600)

Intel - Yorkfield

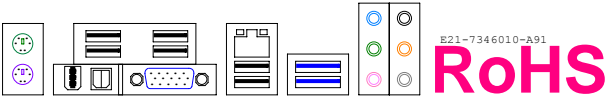
- System Chipset:**
- Intel Bearlake P35/G33 (North Bridge) Rev : A2 [SLA9R/SLA9Q]
- Intel ICH9R / ICH9 (South Bridge) Rev : A2 [SLA9N/SLA9M]

- On Board Chipset:**
- CLOCK : ICS9LPRS906CG
- LAN : RTL8111B
- IEEE1394a : VT6308 Ver : CD
- IDE Bridge : Marvel 88SE6111 Ver : B2
- LPC Super I/O : F71882FG
- Audio Codec : ALC888 7.1 Channel Ver : A1
- BIOS : SPI- 8M

- Main Memory:**
- Dual-channel DDR III * 4 (Max 4GB)

- Expansion Slots:**
- PCI EXPRESS X16 SLOT * 1
- PCI EXPRESS X4 SLOT * 1 Alternative
- PCI EXPRESS X2 SLOT * 2 Alternative
- PCI 2.2 SLOT * 2

ATX Size 305mm * 244mm(OSP)



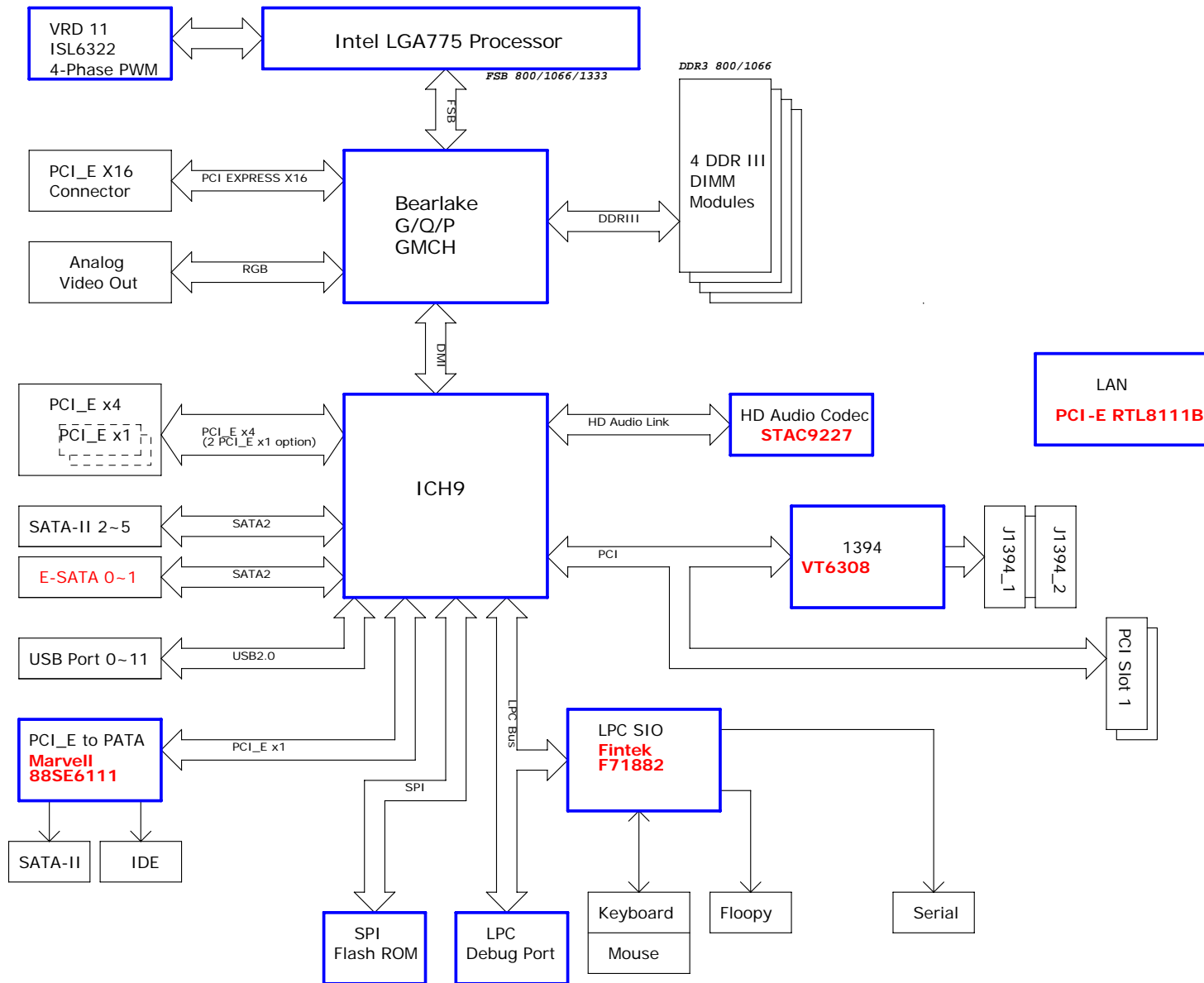
1	Cover Sheet
2	Block Diagram
3	Clock Generate - ICS9LPRS906
4	Intel LGA775 - Signals
5	Intel LGA775 - Power
6	Intel LGA775 - GND
7	Intel Bearlake - FSB / PCIE / VGA / DMI
8	Intel Bearlake - Memory
9	Intel Bearlake - Power
10	Intel Bearlake - GND
11	DDR III DIMM 1 Channel A
12	DDR III DIMM 2 Channel B
13	ICH9 - PCI / DMI / USB / PCIE
14	ICH9 - CPU / SATA / RTC / MSIC
15	ICH7 - POWER / GND
16	PCI - Express X16 Slot / X4 Slot
17	PCI - Express X1 Slot
18	PCI Slot 1 / PCI Slot 2
19	PCI - Express LAN RTL8111B
20	PCI - Express IDE / SATA - 88SE6111
21	PCI IEEE-1394 VT6308
22	Azalia Code ALC888 / ALC888T
23	LPC I/O - F71882FG
24	On Board VGA Connector
25	USB Connector
26	FDD / IDE / SATA / eSATA / FANConnector
27	VRM 11 - ISL6322CR
28	ACPI Controller UPI
29	UPI Switch Power
30	ATX POWER / Panel / SMBUS ISO

2007.06.01

MODEL	Config.	ORCAD Config.	Function	Option	ERP Number	PCB	
MS7356	STD	cfg7356-std	Intel G33(A2) + ICH9R(A2) + IEEE1394 + IDE Bridge + ALC888	STD		Black v10	CH
MS7356	A	cfg7356-a	Intel P35(A2) + ICH9R(A2) + IEEE1394 + IDE Bridge + ALC888T	A	601-7356-010.003	Black v10	CH
MS7356	A	cfg7356-a	Intel P35(A2) + ICH9R(A2) + IEEE1394 + IDE Bridge + ALC888T	A	601-7356-020.002	Black v11	CH
MS7356	B	cfg7356-b	Intel P35(A2) + ICH9R(A2) + IEEE1394 + IDE Bridge + ALC888	B	601-7356-030.001	Black v11	CH

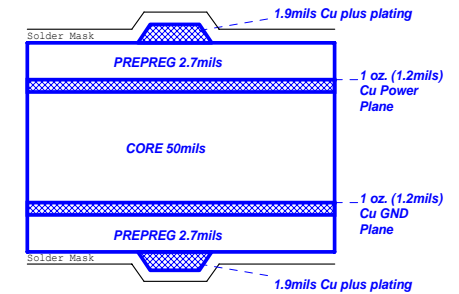
MSI Link to the Future MICRO-START INTL CO.,LTD.		
Cover Sheet		
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Block Diagram

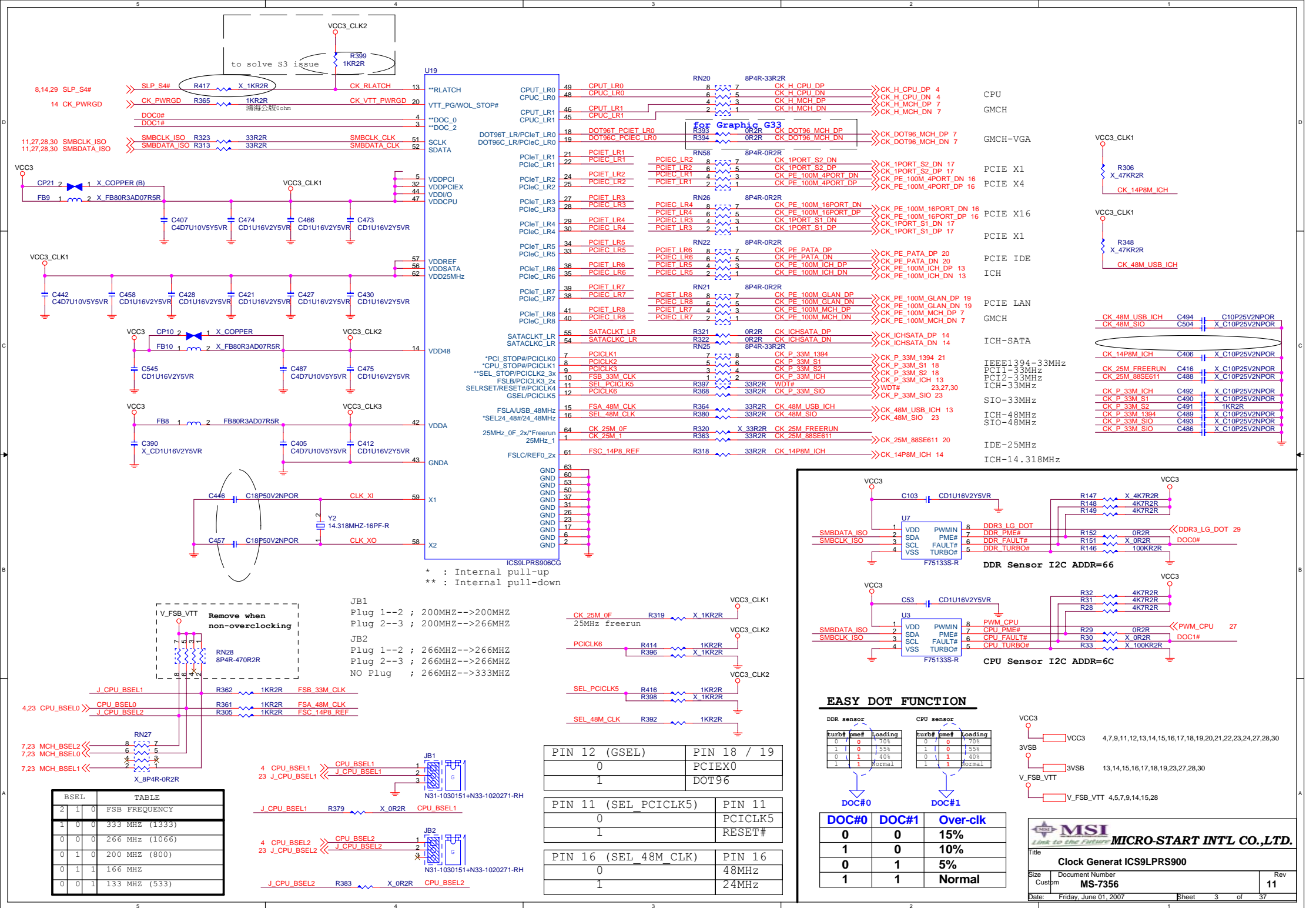


Board Stack-up

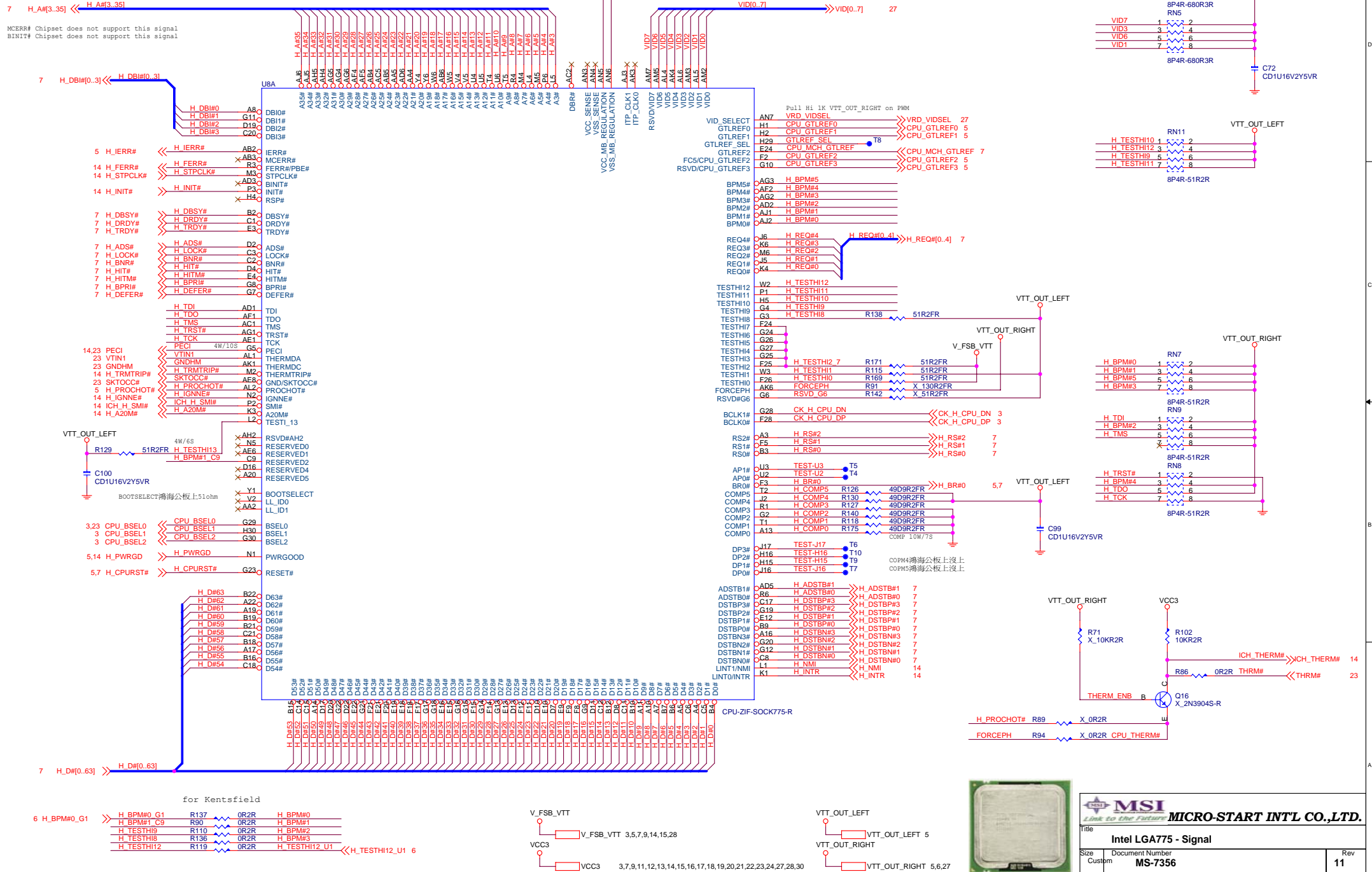
(1080 Prepreg Considerations)

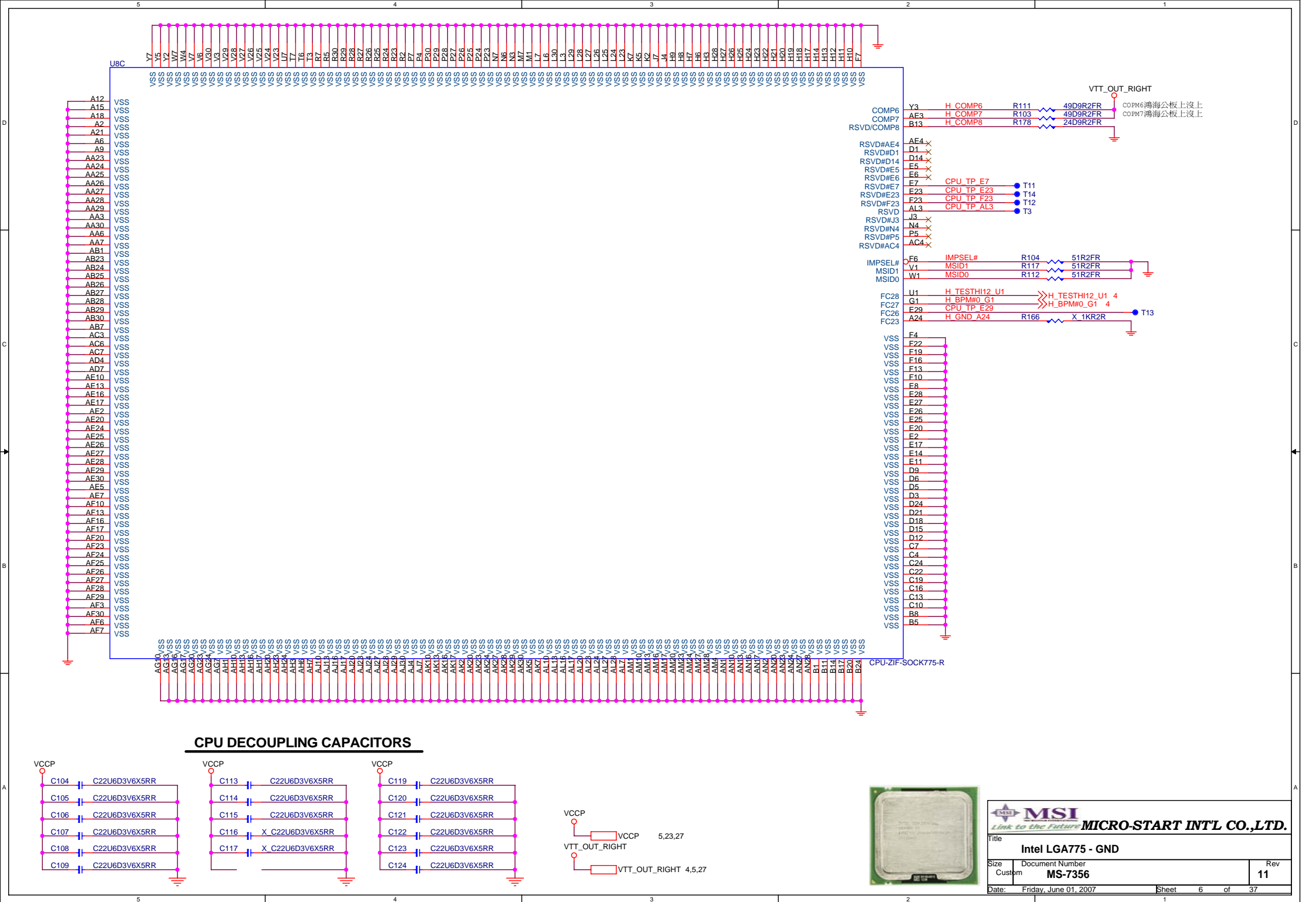


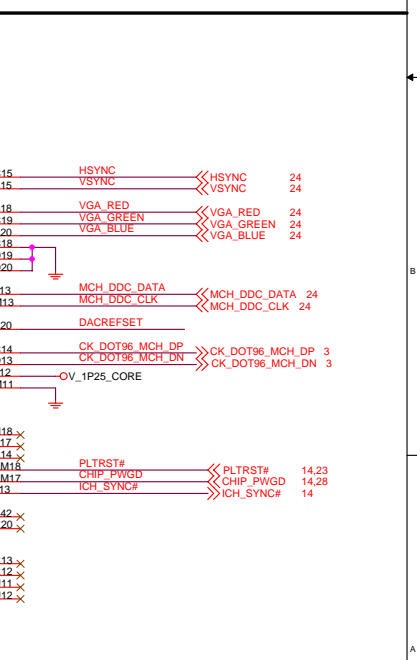
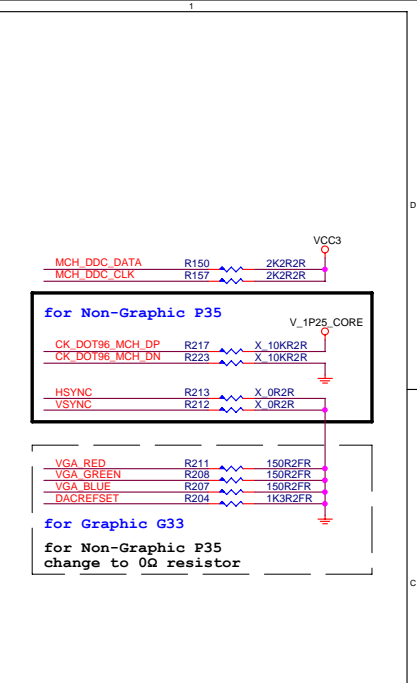
Single End 50ohm Top/Bottom : 4mils
 USB2.0 - 90ohm : 15/4.5/7.5/4.5/15
 SATA - 95ohm : 15/4/8/4/15
 LAN - 100ohm : 15/4/8/4/15
 PCIE - 95ohm : 15/4/8/4/15
 IEEE1394 - 110ohm : 15/4/9/4/15
 IDE : 15/4/8/4/15



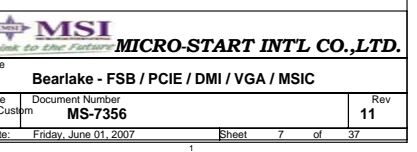
CPU SIGNAL BLOCK

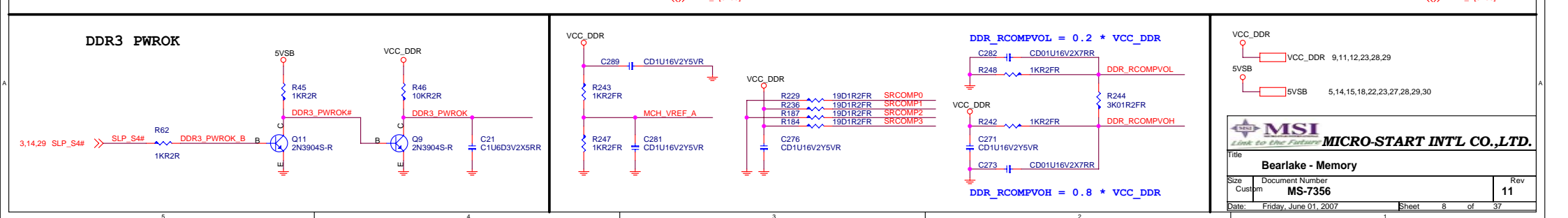
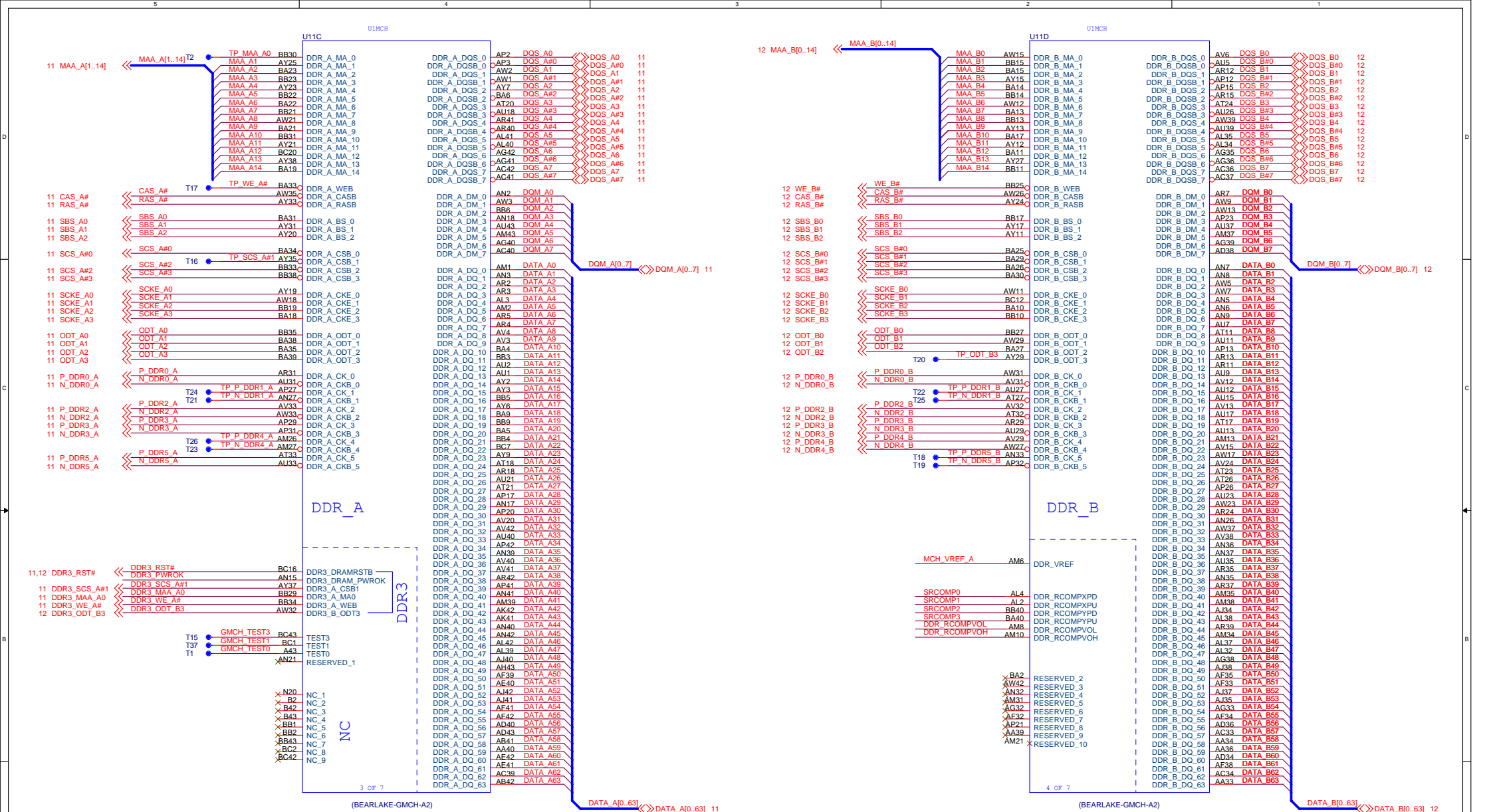




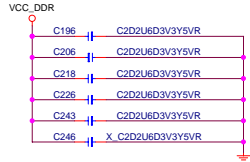


GMCH STRAPPING RESISTOR			
PIN	H	L	Description
MTYPE (G18)	DDR2	DDR3	MEMORY TYPE
EXP_SLR (E18)	Normal (ATX)	Reverse (BTX)	PCI*16 Lane Reversal
EXP_EN (J17)	Concurrent	Non-concurrent	PCI_E/SDVO co-existence
MCH_TCEM (E20)	Enable	Disable	TLS confidentiality

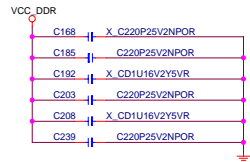




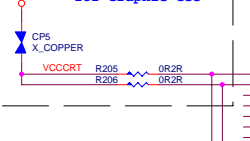
Place close to GMCH



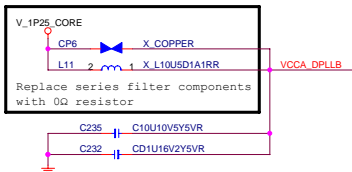
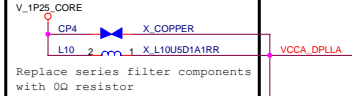
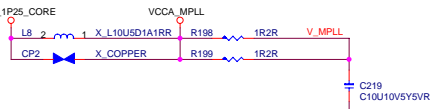
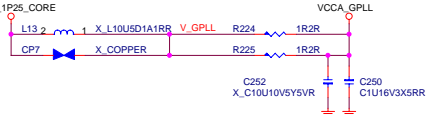
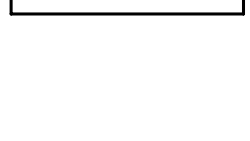
Place close to GMCH with DIMM1



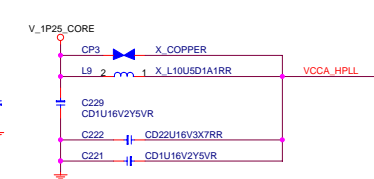
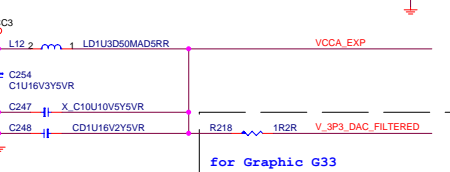
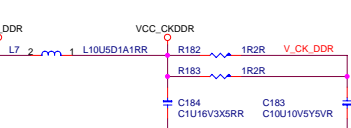
V_1P5_ICH for Graphic G33



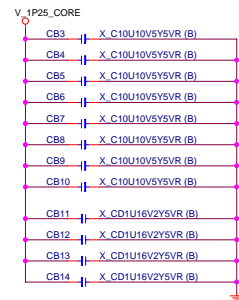
for Non-Graphic P35 change to 0Ω resistor



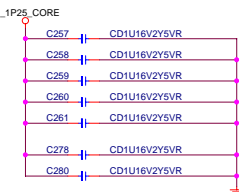
POWER



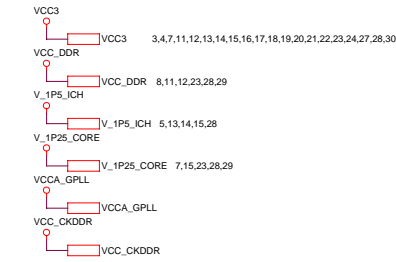
Place close to GMCH Bottom

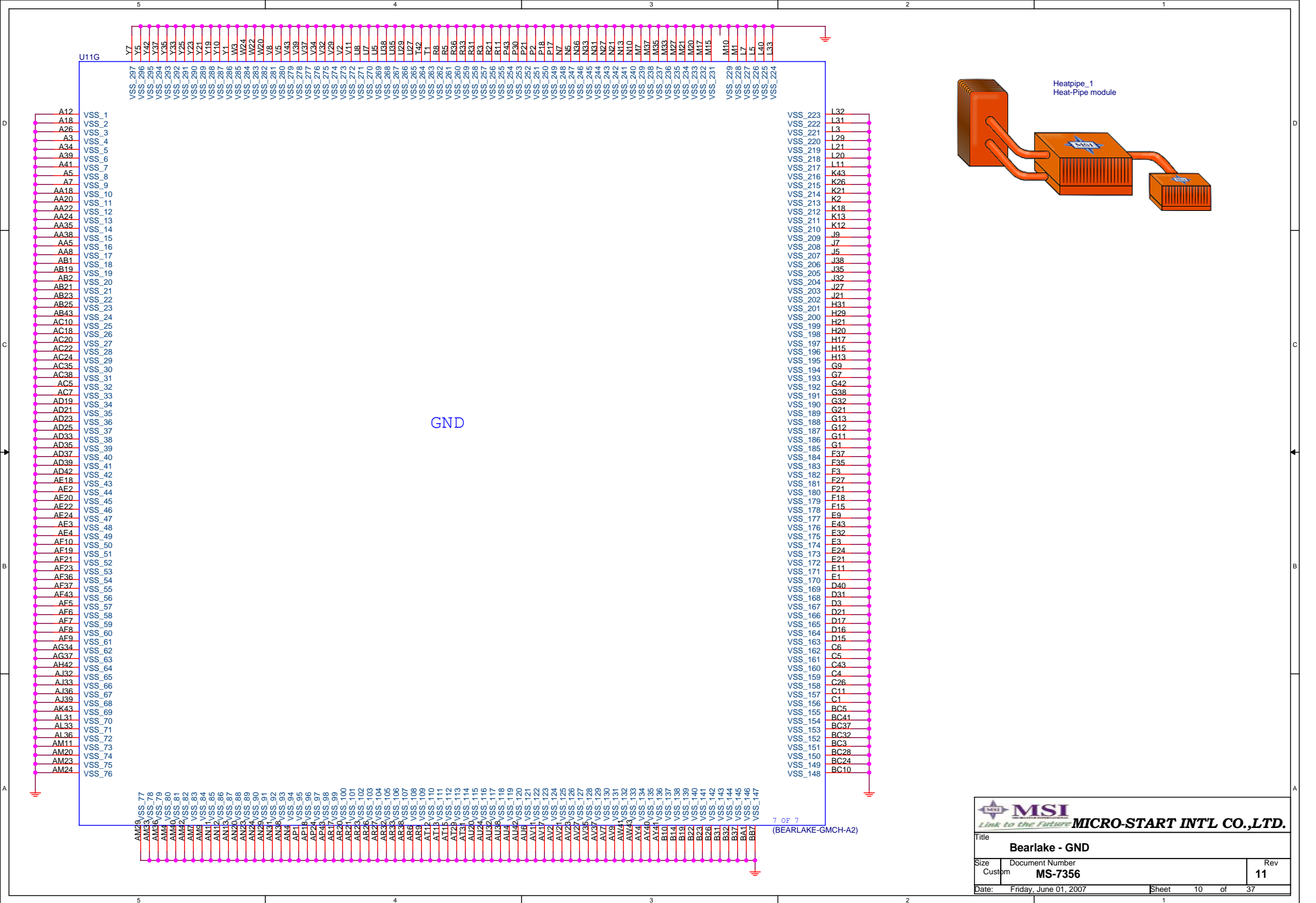



Place close to GMCH



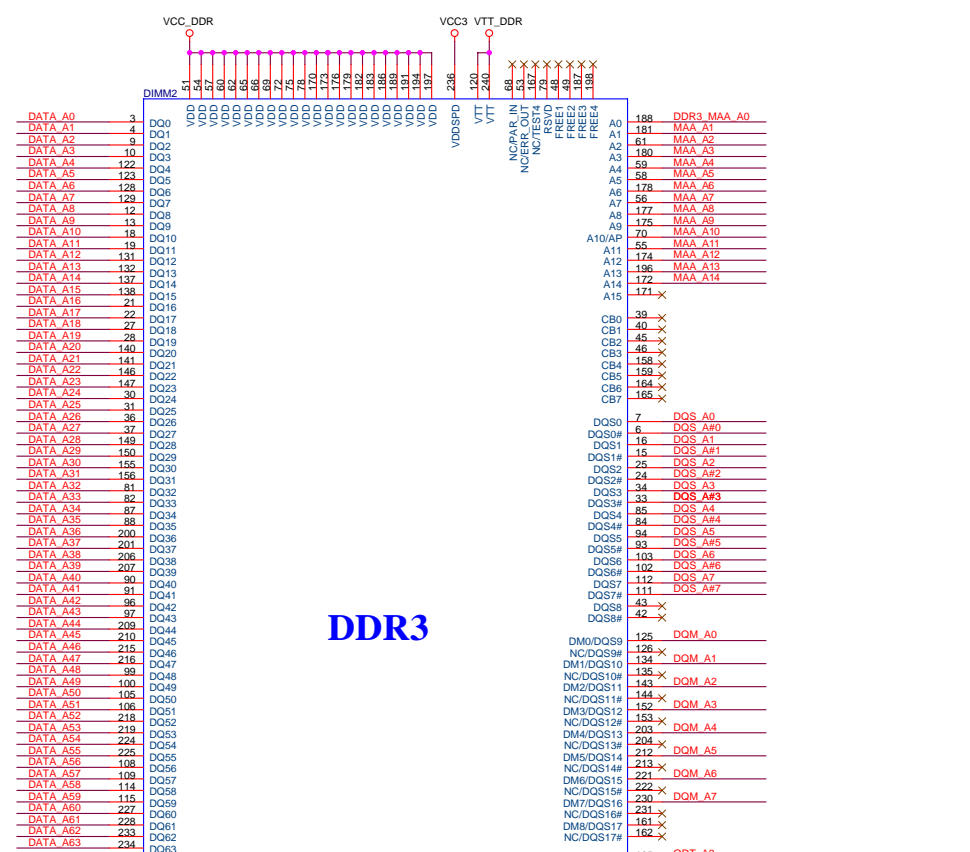
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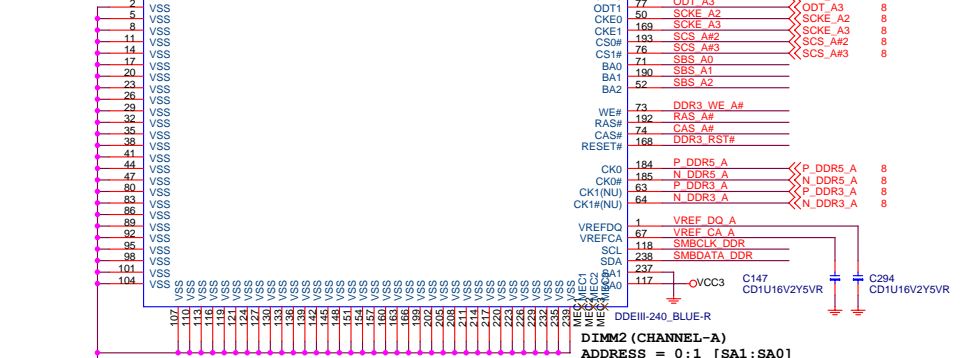



 MICRO-START INTL CO.,LTD.		
Title		
Bearlake - GND		
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DDRIII DIMM_A2

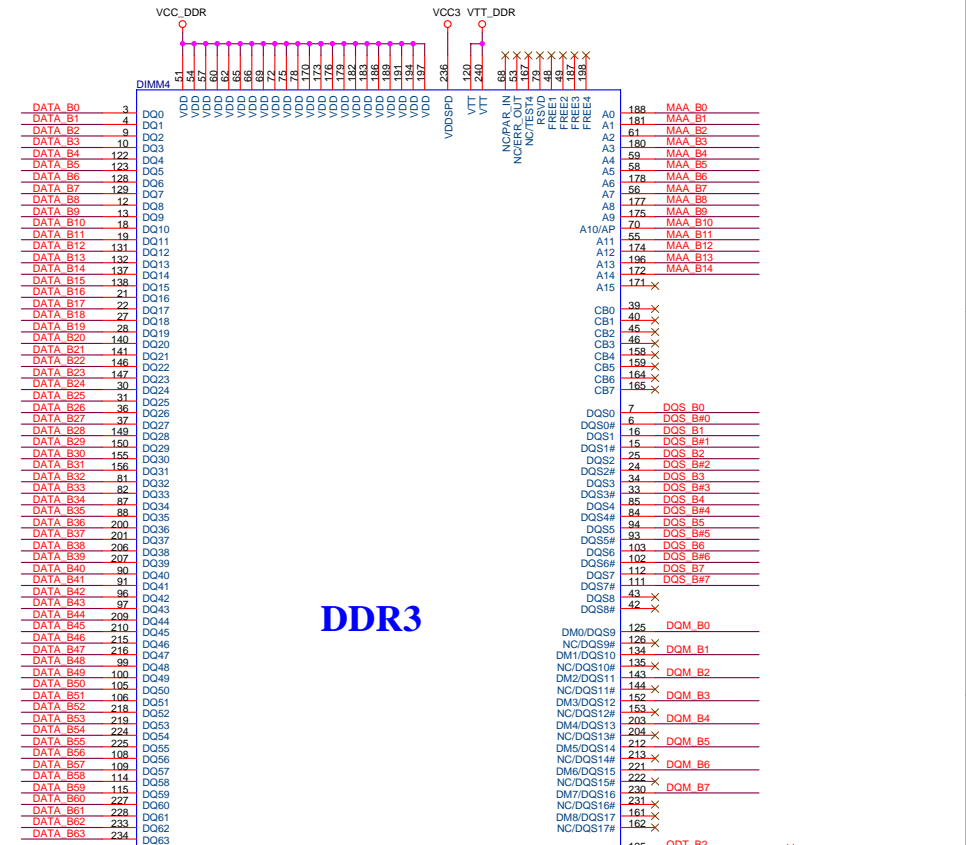


DDR3



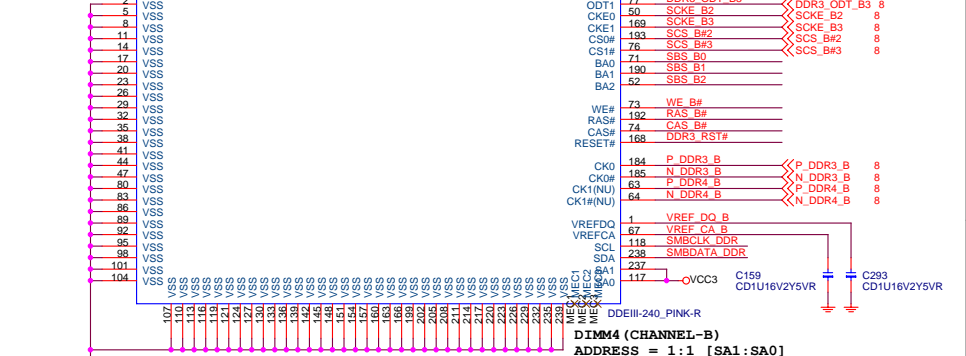
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Title DDR III DIMM 1 Channel A / DIMM 2 Channel A							
Size Custom		Document Number MS-7356				Rev 11	
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DDRIII DIMM_B2

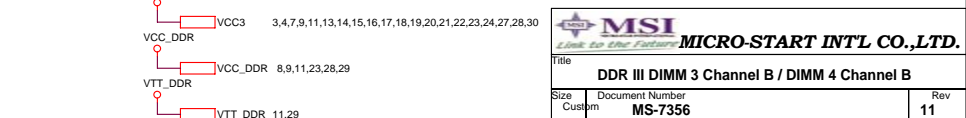


DDR3

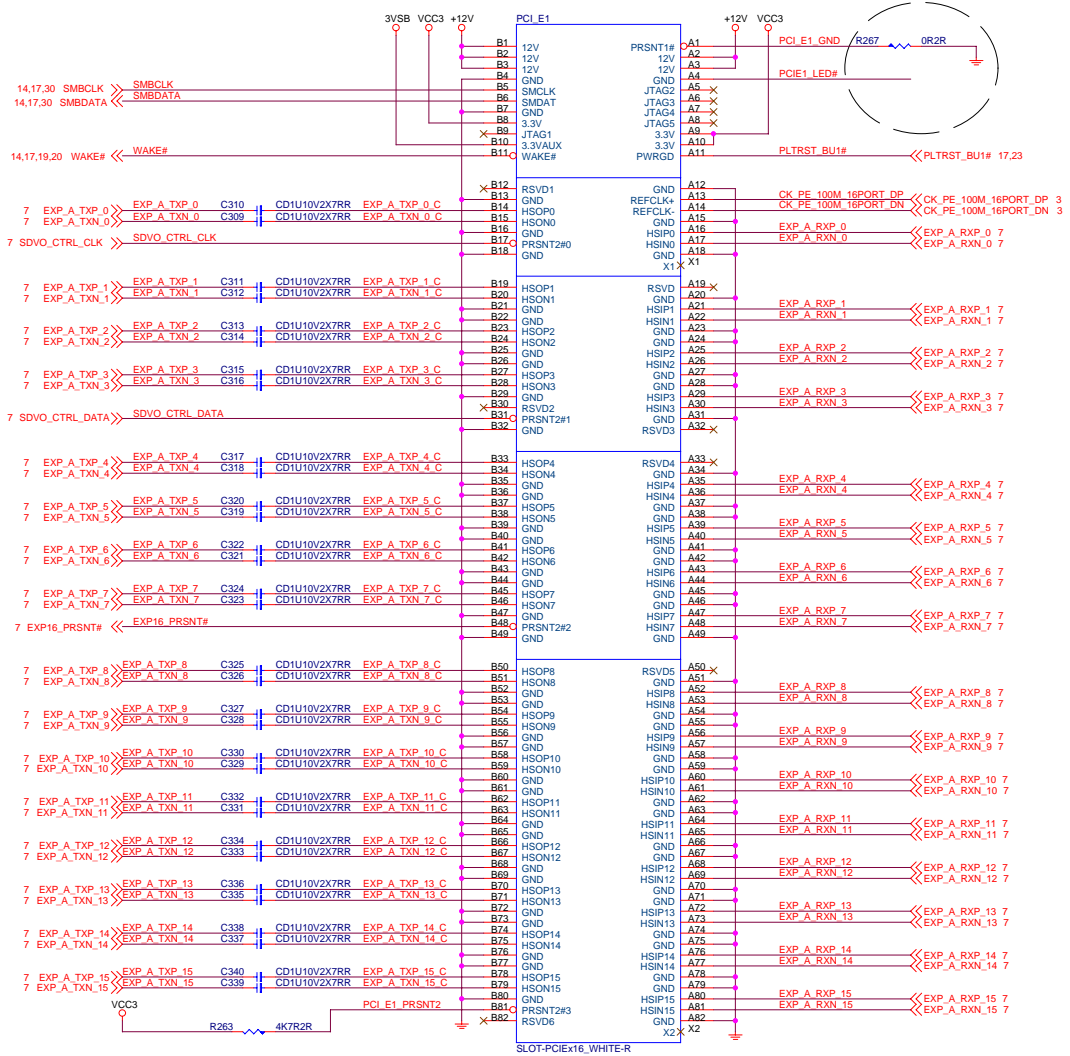
Place close to DIMM3



RESET#(Output) : A synchronously forces all registered output LOW when RESET# is LOW. This signal can

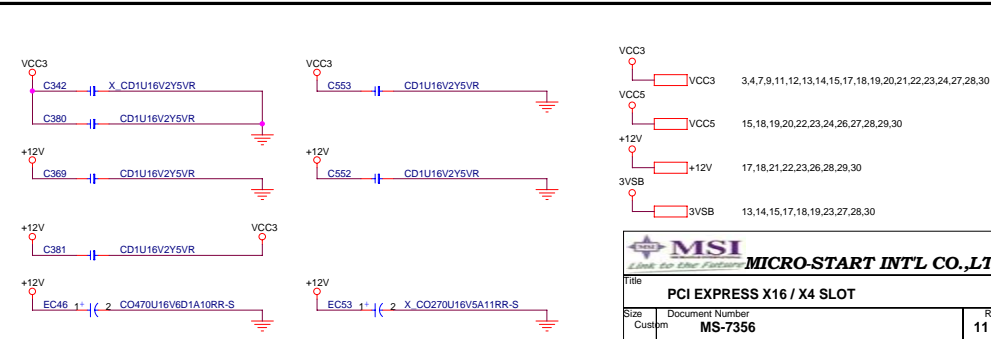
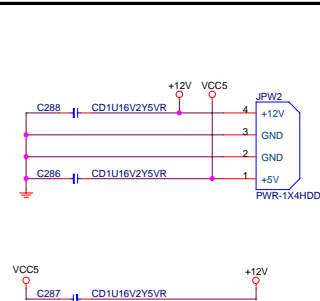
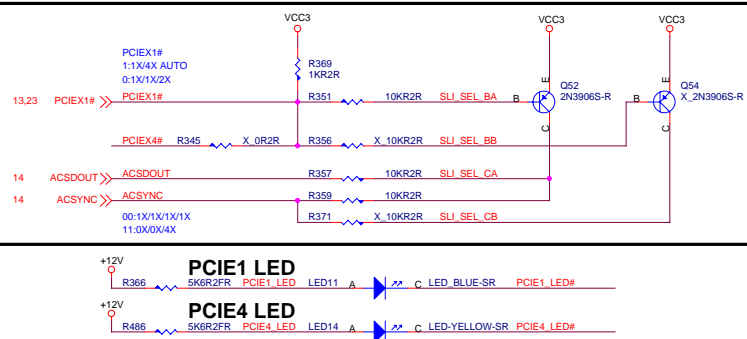


PCI Express X16 Slot

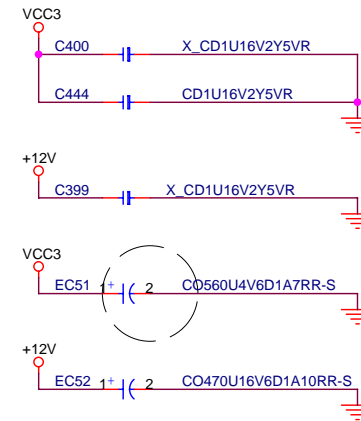
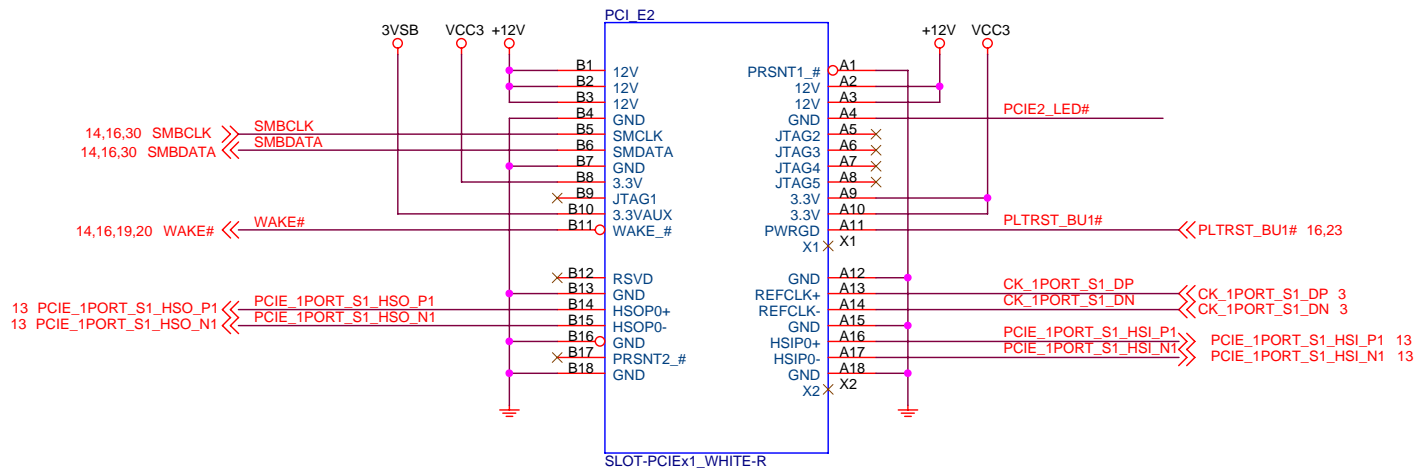


PCI Express X4 Slot

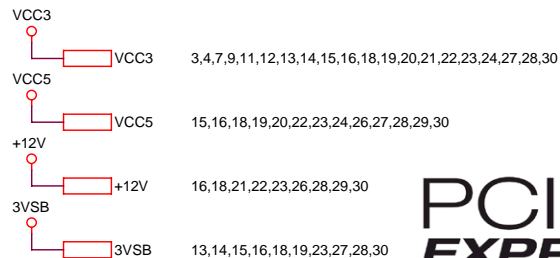
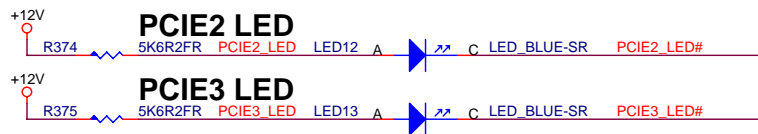
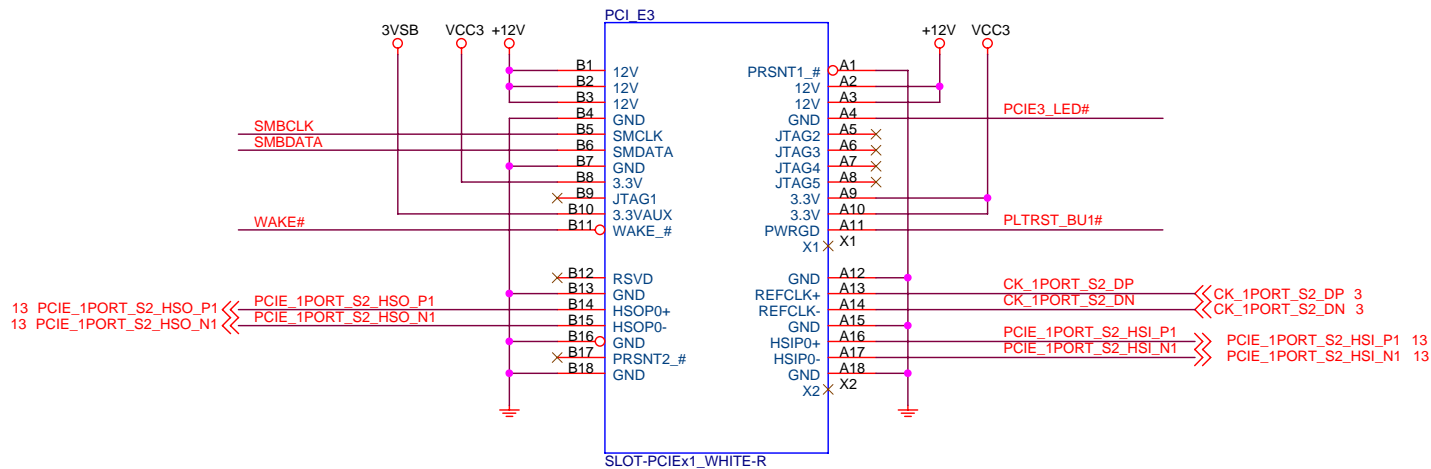
(Share with PCI E x1 Slots)





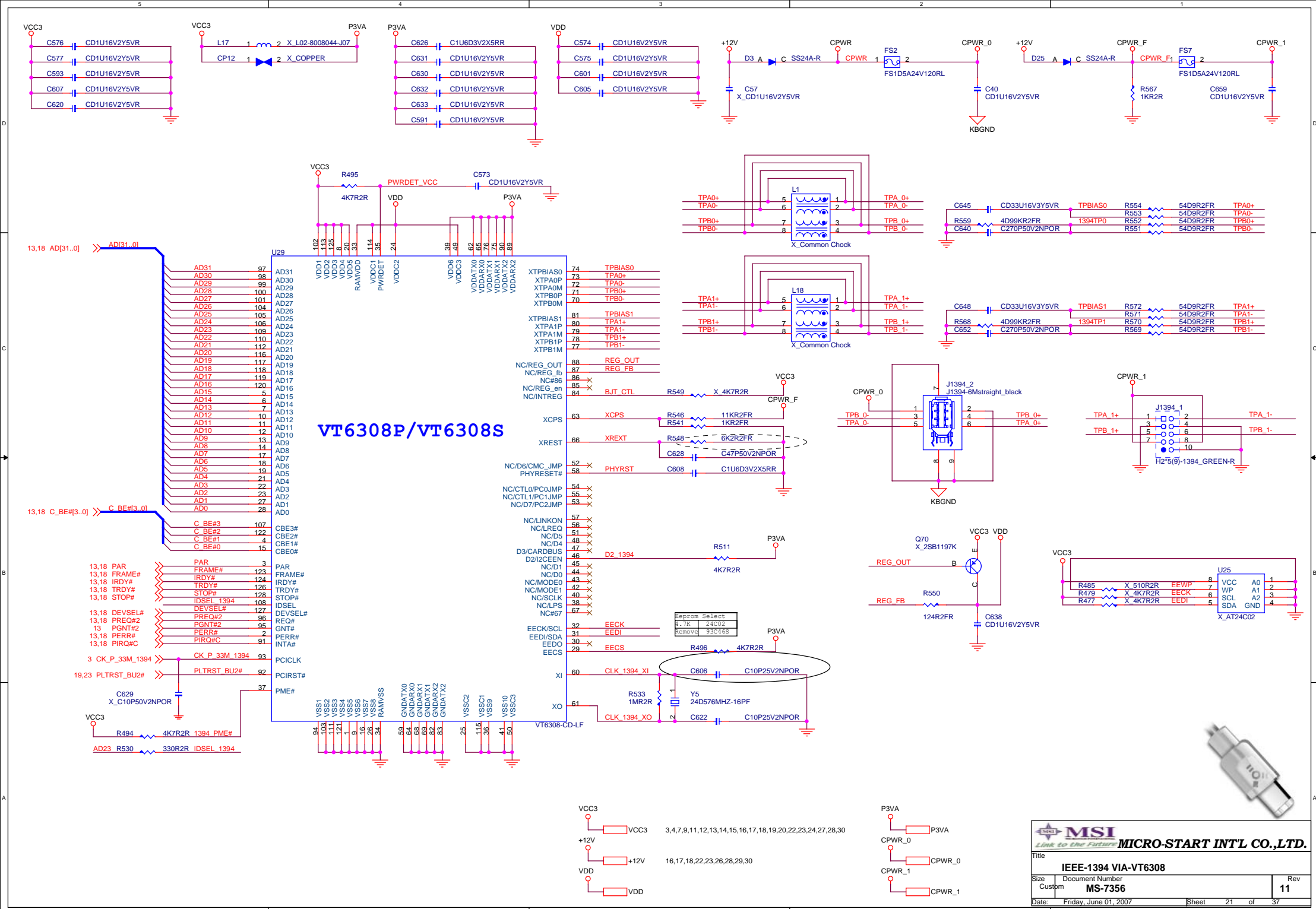
PCI EXPRESS x1-PORT

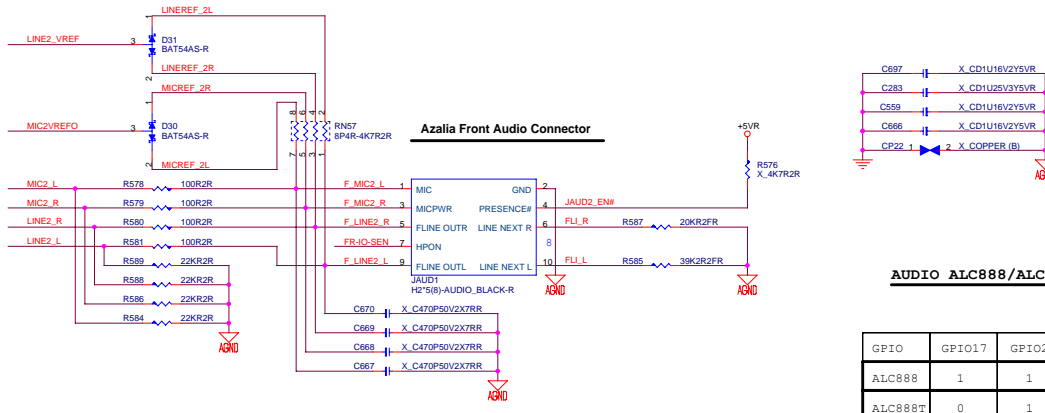
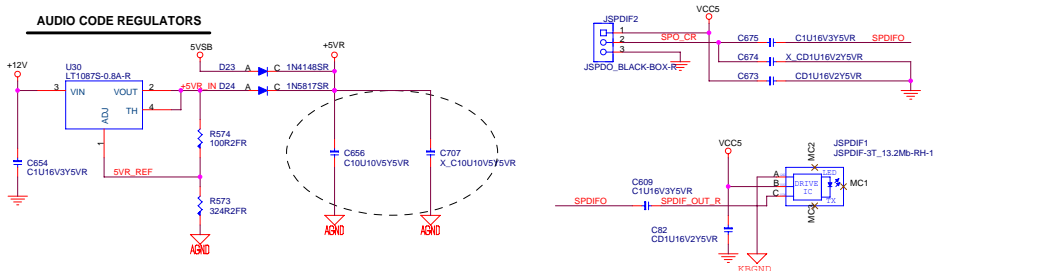
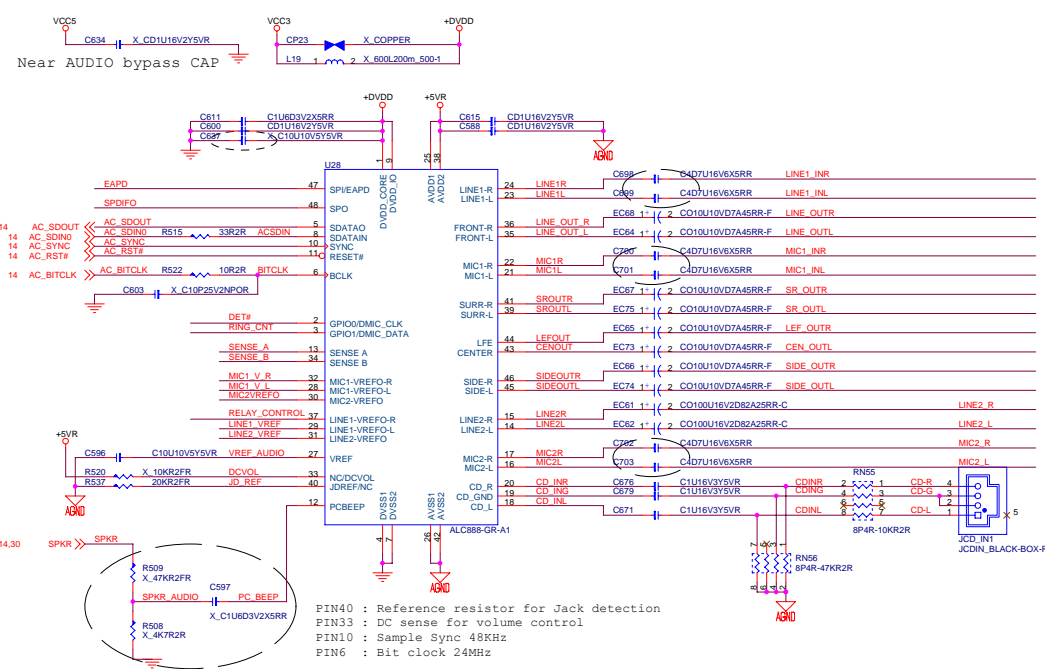


PCI EXPRESS x1-PORT



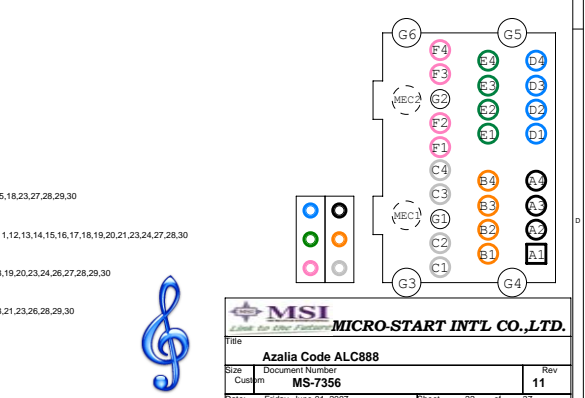
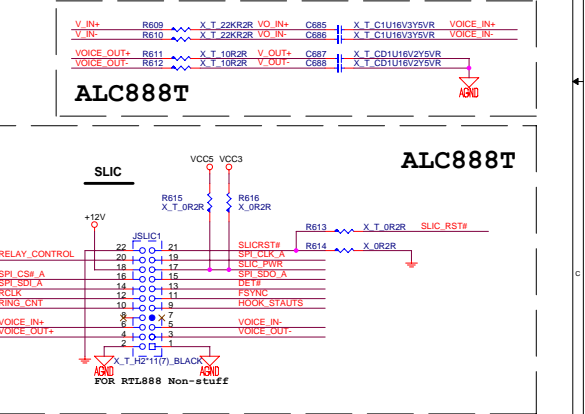
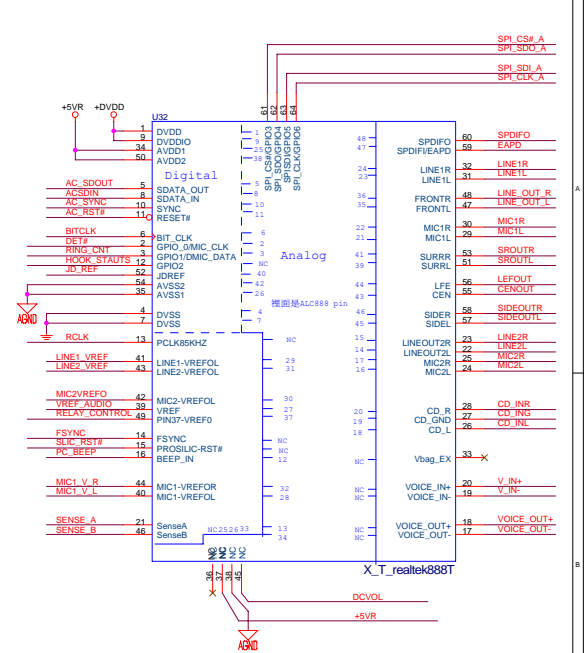
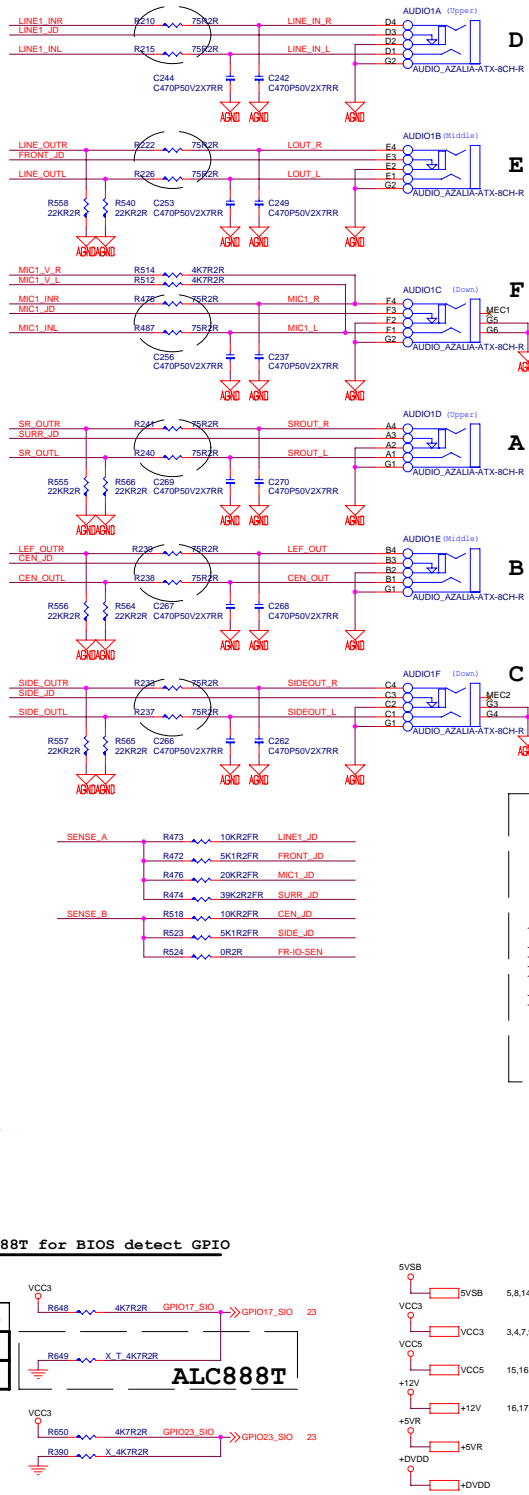
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PCI EXPRESS X1 SLOT					
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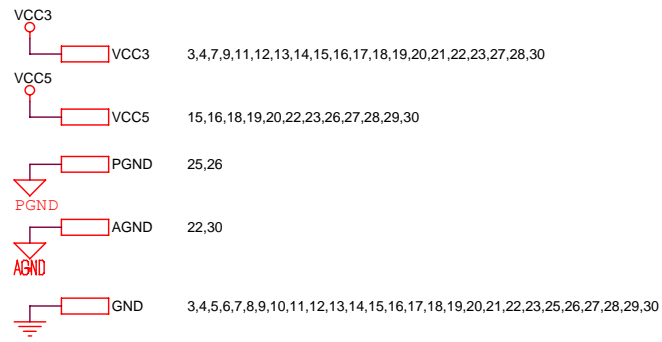
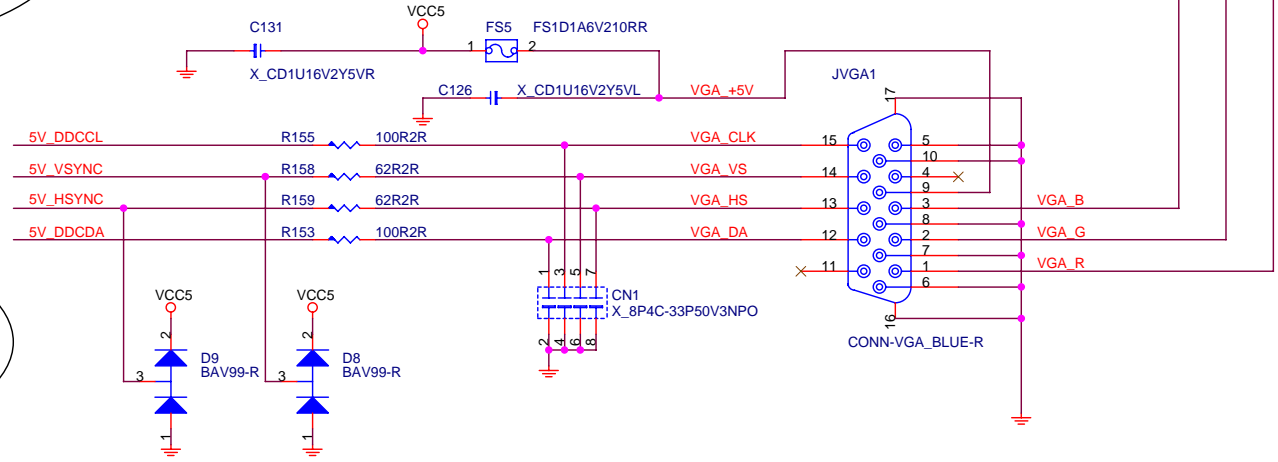
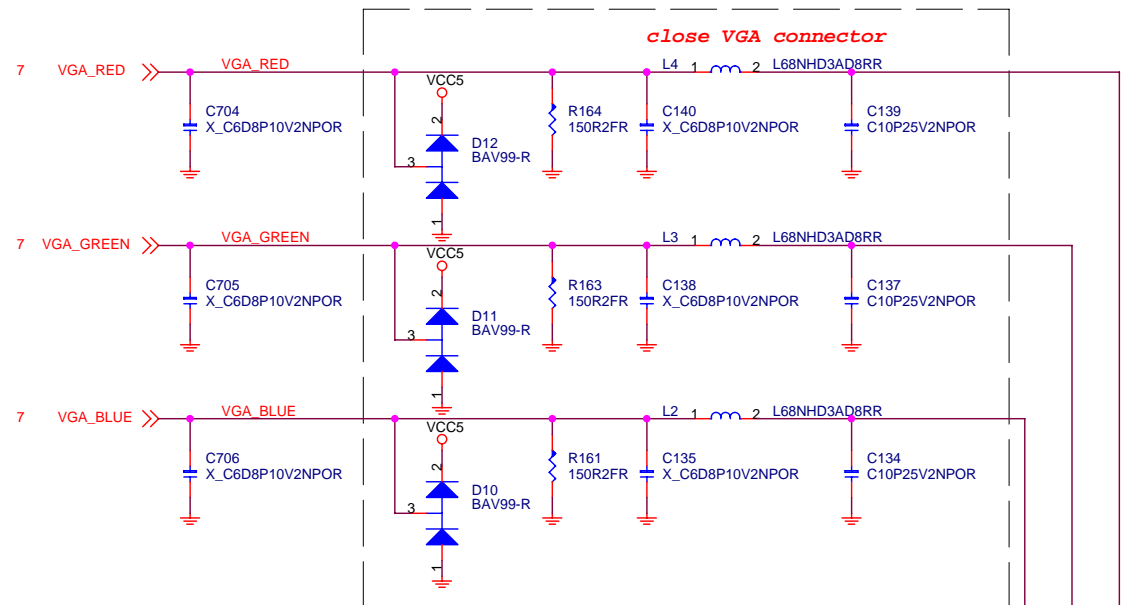
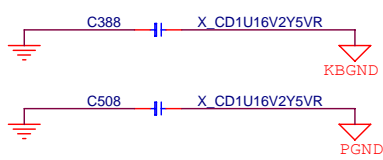
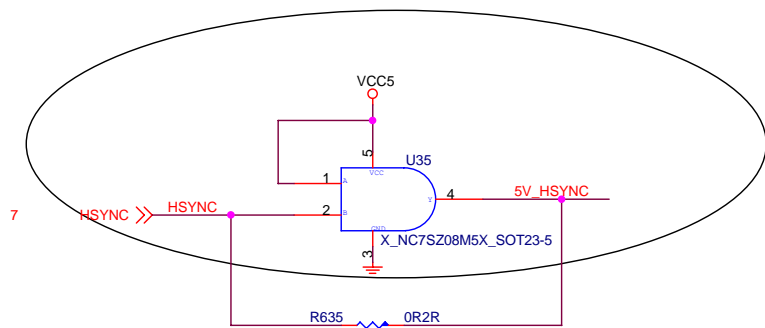
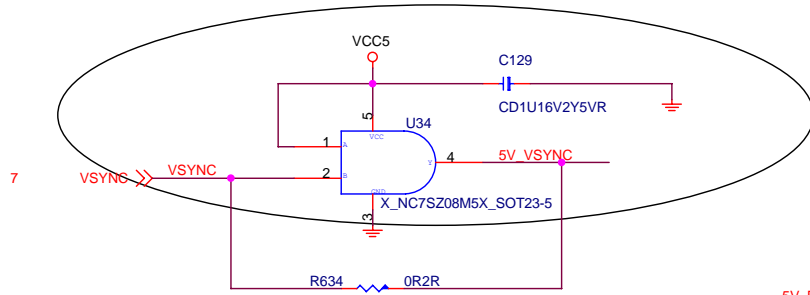
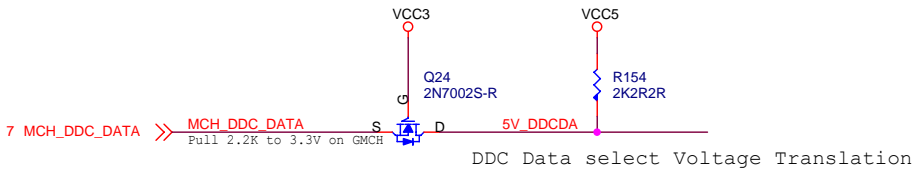
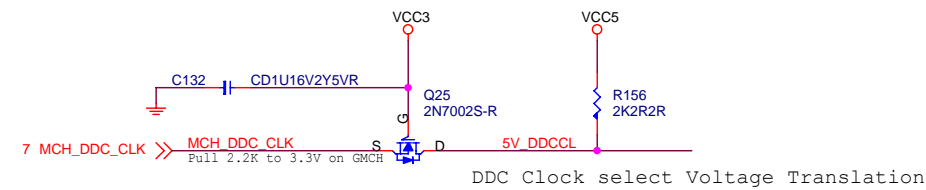


AUDIO ALC888/ALC888T for BIOS detect GPIO

GPIO	GPIO17	GPIO23
ALC888	1	1
ALC888T	0	1



Pin 1: +5VSB
Pin 2: +5VSB
Pin 3: RUSB_STR
Pin 4: RUSB_STR 25,28
Pin 5: VBAT0
Pin 6: VBAT0 14
Pin 7: 5VSB
Pin 8: 5VSB 5,8,14,15,18,22,27,28,29,30
Pin 9: 3VSB
Pin 10: 3VSB 13,14,15,16,17,18,19,27,28,30
Pin 11: +12V
Pin 12: VCC5 16,17,18,21,22,26,28,29,30
Pin 13: VCC5
Pin 14: VCC5 15,16,18,19,20,22,24,26,27,28,29,30
Pin 15: VCC3
Pin 16: VCC3 3,4,7,9,11,12,13,14,15,16,17,18,19,20,21,22,24,27,28,30
Pin 17: VCC_DDR
Pin 18: VCC_DDR 8,9,11,12,28,29
Pin 19: V_1P25_CORE
Pin 20: V_1P25_CORE 7,9,15,28,29
Pin 21: VCCP
Pin 22: VCCP 5,6,27
Pin 23: -12V
Pin 24: -12V 18,30



for Graphic G33

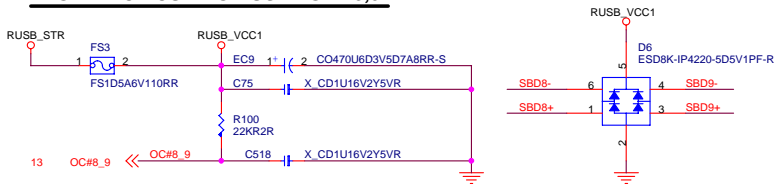
MSI
Link to the Future
MICRO-START INT'L CO.,LTD.

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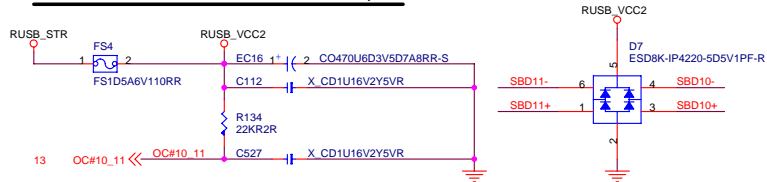
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Rear USB Connector

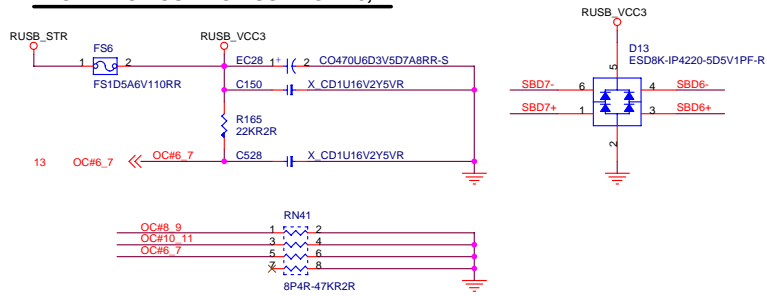
POWER CIRCUIT FOR USB PORT 3,6



POWER CIRCUIT FOR USB PORT 9,10

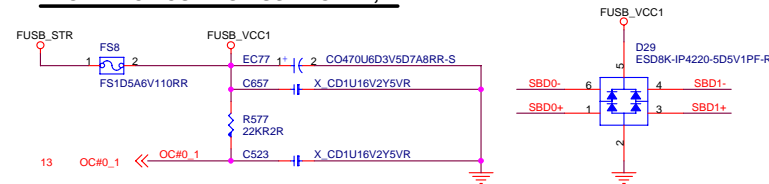


POWER CIRCUIT FOR USB PORT 0,2

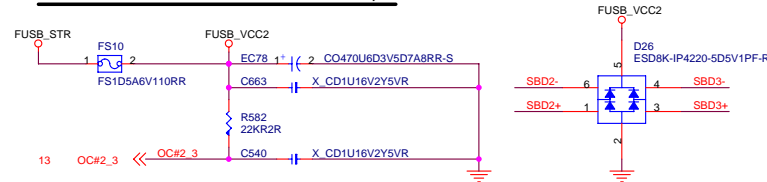


Front USB Connector

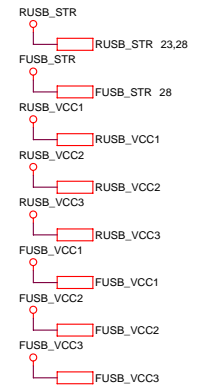
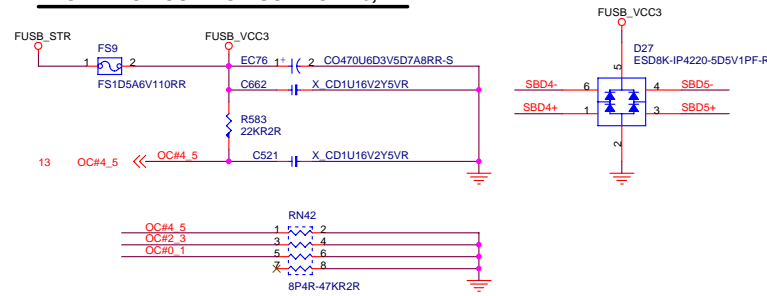
POWER CIRCUIT FOR USB PORT 1,4



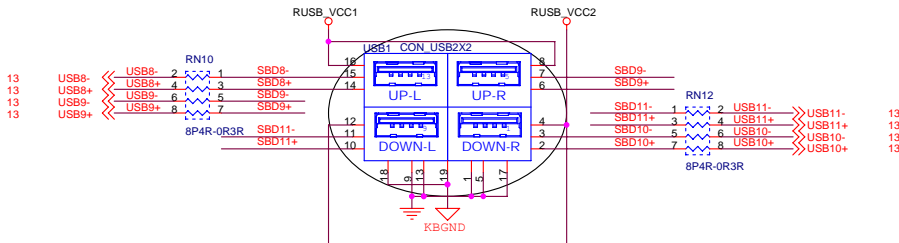
POWER CIRCUIT FOR USB PORT 5,7



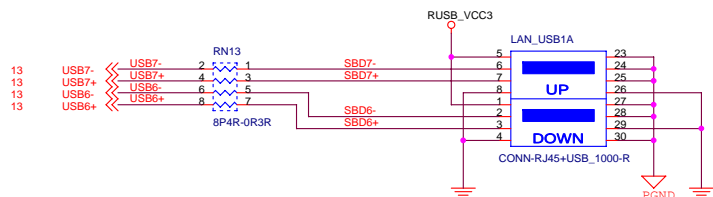
POWER CIRCUIT FOR USB PORT 8,11



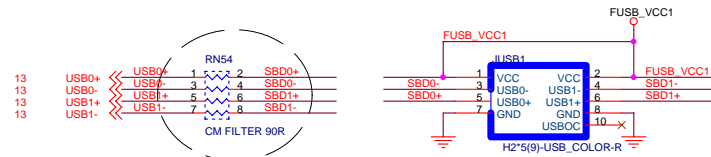
REAR PANEL USB CONNECTOR FOR USB PORT 6,3,9,10



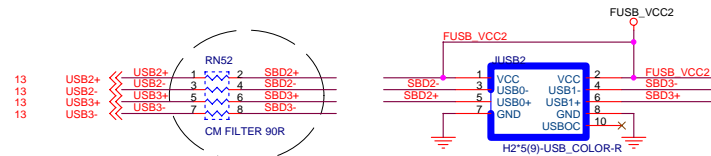
REAR PANEL USB CONNECTOR FOR USB PORT 0,2



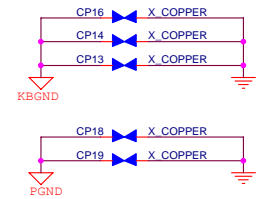
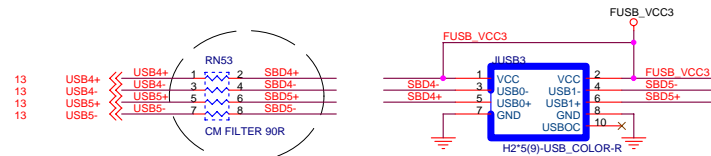
FRONT PANEL USB CONNECTOR FOR USB PORT 1,4




FRONT PANEL USB CONNECTOR FOR USB PORT 5,7

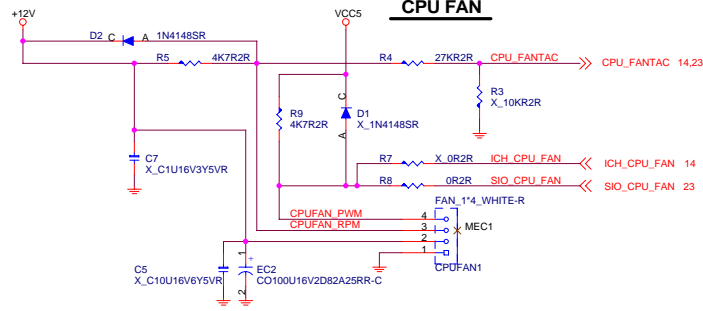


FRONT PANEL USB CONNECTOR FOR USB PORT 8,11

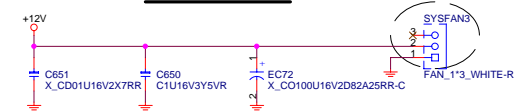


 MSI <i>Link to the Future</i>				MICRO-START INT'L CO.,LTD.			
Title							
USB Connector							
Size		Document Number				Rev	
Custom		MS-7356				11	
Date:		Friday, June 01, 2007		Sheet		25 of 37	

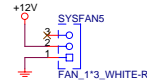
CPU FAN



SYSTEM FAN 3

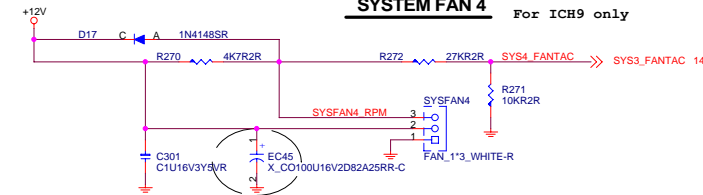


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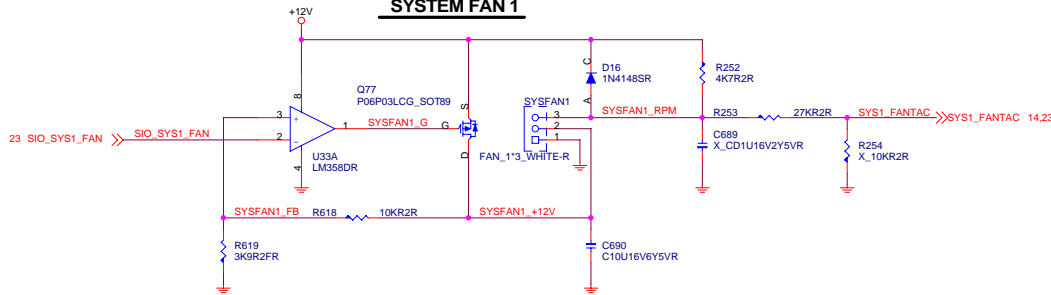


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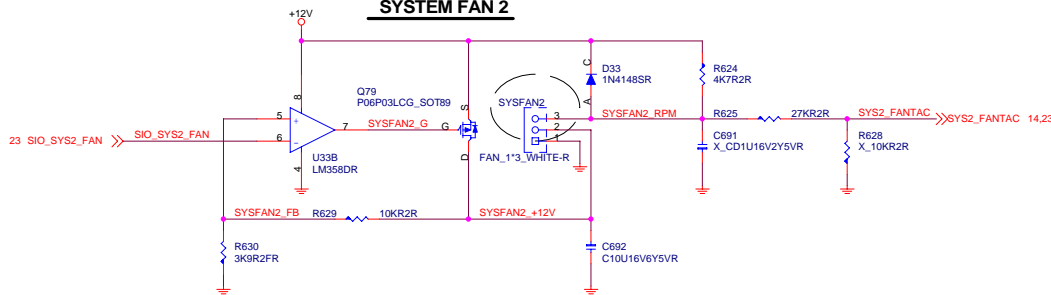
For ICH9 only



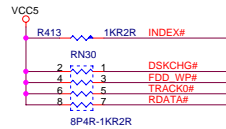
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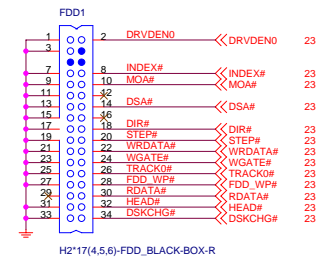
SYSTEM FAN 2



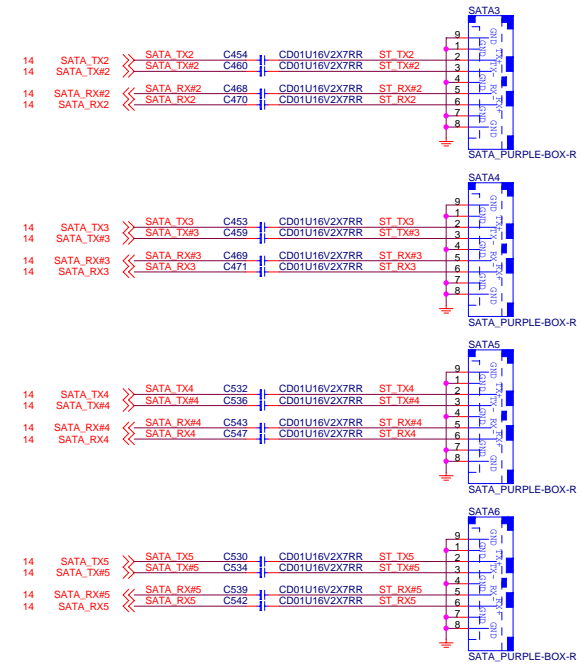
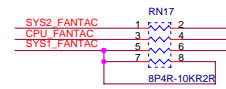
FLOPPY CONNECTOR



NEED INFORMED BIOS



Peak FAN current draw ----- 1.5A
Average FAN current draw --- 1.1A
Fan Start-up current draw -- 2.2A



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



[illegible]

ICB GPIO2/3 for over voltage V_1P5_ICH

V1_5SET_0=	V1_5SET_1=	1.5V
V1_5SET_0=1	V1_5SET_1=0	1.6V
V1_5SET_0=0	V1_5SET_1=1	1.7V
V1_5SET_0=1	V1_5SET_1=1	1.8V

[illegible][illegible][illegible][illegible][illegible]

The schematic diagram illustrates the power management circuitry. Key components and connections include:

- VCC3** is connected to **CHIP_PWGD** through resistors **R631** and **R632** (both 4K7R2R).
- CHIP_PWGD** is connected to **CHIP_PWGD_B** through a 4K7R2R resistor.
- ICH_VRM_PGD** is connected to **VRM_PWROGD_B** through resistor **R633** (4K7R2R).
- ATX_PWR_OK** (pins 23, 29, 30) is connected to **ATX_PWR_OK_B** through resistor **R407** (20K2R2R).
- SIO_PWROK** (pin 23) is connected to **ATX_PWR_OK_B** through resistor **R405** (4K7R2R).
- The circuit includes transistors **Q55** (2N3904-R), **Q34** (2N3904-R), and **Q75** (2N3904-R).
- Other labels include **14.27 ICH_VRM_PGD**, **7.14 CHIP_PWGD**, and **23.29.30 ATX_PWR_OK**.

The diagram illustrates the internal circuitry of the ATX connector for the PWR-2X12M-WHITE-R power supply. It shows the 24-pin ATX1 connector and the 5-pin POK connector. The circuit includes a 5VSB output, a 5V output, and a P_ON signal. Key components include resistors R186 (4K7R2R), R255 (X_1K275FR), R504 (1K2R), and R256 (X_1K1R), capacitors C178, C181, C197, C251, C275, C284, C288, and C289, and the PWR-2X12M-WHITE-R power supply unit. The diagram also shows the connection to the ATX connector pins and the P_ON signal line.

SM BUS ISO

The diagram illustrates the SM BUS ISO circuit. It features two signal paths: SMBCLK and SMBDATA. Both paths originate from a +12V supply, pass through a 10K pull-down resistor (R251, R254), and then through a 1K resistor (R246, R245) to a 2N7002-R MOSFET (Q36, Q37). The MOSFETs are configured as source followers. The SMBCLK path includes a 2.2K pull-up resistor (R231) to VCC3 and a 2K pull-down resistor (R228) to ground. The SMBDATA path includes a 2.2K pull-up resistor (R230) to VCC3 and a 2K pull-down resistor (R227) to ground. Both paths are connected to the SMBCLK and SMBDATA pins of the ICH. The circuit is protected by a 180P50V3NPNOR diode (C279, C277) connected to ground. The output signals are SMBCLK (14,16,17) and SMBCLK_ISO (3,11,27,28).

H.D. LED

VCC3

R332 4K7R2R

R542 10KR2R

D21 BAT54AS-R

D22 BAT54AS-R

C546 X_CD1U16V2Z5VR

HDDL

Open-collector

20 JM_IDELED#

14 ICH_SATALED#

JM_IDELED#

ICH_SATALED#

Power LED

The diagram illustrates the connection for a Power LED. It features an 8P4R-1KR2R resistor network. The network's input terminals are connected to LED_VCC and LED_VSB. The network has two output terminals: PWR_LED# and SUS_LED#. PWR_LED# is connected to the anode of a blue LED (Q68 2N3904S-R), and its cathode is connected to ground. SUS_LED# is connected to the anode of another blue LED (Q68 2N3904S-R), and its cathode is also connected to ground. A 3VSB supply is indicated at the top of the circuit.

INTEL Front Panel

The diagram illustrates the electrical connections for the Intel Front Panel. It shows two main connectors: JFP1 (Front Panel A-R) and JFP2 (Front Panel B-R).

Front Panel A-R (JFP1) Connections:

- Power:** 3VSB is connected to pin 1 (HDD+) through resistor R527 (1K Ω). 5VSB is connected to pin 2 (PLED) through resistor R534 (1K Ω). VCC5 is connected to pin 3 (HDD-) through resistor R539 (10K Ω).
- Reset:** RST# is connected to pin 4 (RESET-) through resistor R539 (10K Ω). PWRST# is connected to pin 5 (RESET+) through resistor R539 (10K Ω).
- NC:** Pin 6 (NC) is connected to pin 7 (NC) through resistor R539 (10K Ω).
- Switch:** SWITCH_ON# is connected to pin 8 (SWITCH_ON#) through resistor R536 (10K Ω).
- Capacitors:** C623 (CD1U16V2Y5VR) is connected to pin 1. C647 (CD1U16V2Y5VR) is connected to pin 2. C619 (CD1U16V3Y5VR) is connected to pin 8.

Front Panel B-R (JFP2) Connections:

- LEDs:** SUS_LED is connected to pin 1 (SLED). PWR_LED is connected to pin 2 (PLED). HDD_LED is connected to pin 3 (HDD+).
- Buzzer:** BUZZER is connected to pin 4 (BUZZ-). VCC5 is connected to pin 5 (BUZZ+).
- NC:** Pin 6 (NC) is connected to pin 7 (NC) through resistor R539 (10K Ω).

Test Only: The diagram includes a section labeled "Test Only" showing the connection of the LEDs and buzzer to the system. The LEDs are connected to the system through resistors (R527, R534, R539, R536).

[illegible]