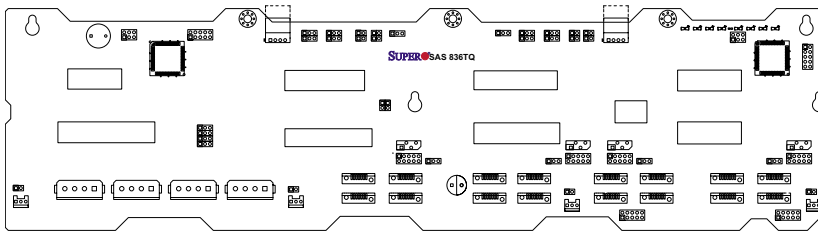
SUPER®



SAS 836TQ Backplane

USER'S GUIDE

Rev. 1.0

Table of Contents

User's Guide Revision: Rev. 1.0
Release Date: 07/31/2006

Safety Information and Technical Specifications

1. Safety Guidelines

To avoid personal injury and property damage, please carefully follow all the safety steps listed below when accessing your system or handling the components:

ESD Safety Guidelines

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the RAID card by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the SAS836TQ Backplane.
- Disconnect the power cable before installing or removing any cable from the SAS836TQ Backplane.
- Make sure that the SAS836TQ Backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

An Important Note to the User

- All images and layouts shown in this user's guide are based upon the latest PCB Revision available at the time of publishing. The card you've received may or may not look exactly the same as the graphics shown in this manual.

2. Introduction to the SAS836TQ Backplane

A. Overview

The SAS836TQ Backplane is a highly efficient, highly compatible and easy to use SES-2 backplane that offers the most advanced functionality provided by the Serial Attached/Serial Link Industry in a slim package. With the built-in AMI MG 9072 chip, the SAS836TQ Backplane allows the user to configure RAID 0, RAID 1 and RAID 5, maximizing data storage capability and data transferring reliability. Additionally, the SAS836TQ supports SATA up to 3Gbps and SAS up to 3Gbps with *SES-2 (SCSI Enclosure Services-2) capabilities, providing complete Serial Attached Services and Serial Link Solutions to the market. (*Refer to the section below.)

B. Backplane Features

The SAS836TQ Backplane supports the following features when it is installed on a motherboard that has an onboard SAS controller:

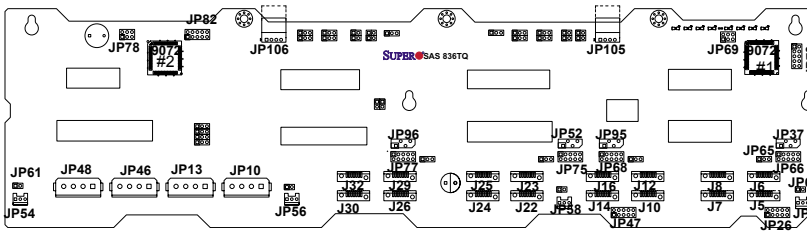
1. Compatible with SATA drives
2. Supporting SAS drives with a transfer rate of 3Gbps
3. Supporting I^2C Interface to communicate with SAS/SATA Host Bus Adaptors (HBA)
4. Minimizing the need for cables and connectors, uncluttering server space, and providing a trouble-free installation environment for the user
5. Supporting SES-2 (SCSI Enclosure Services-2) protocol, providing the following features:
    - Drive activity and drive failure indication for each drive slot
    - Overheat/drive failure alarm via a buzzer installed on the backplane
    - An overheat/drive failure LED Indicator built in
    - Temperature Monitoring via a 2 wire (I^2C) temperature sensor in the MG 9072 chip

3. Backplane Connectors and Jumpers

A. Front Connectors

A-1 Front Connector Locations

Front View



A-2. Front Panel Connector Descriptions

1. JP10/JP13/JP46/JP48: Backplane Main PWR Connectors
2. JP54/JP56/JP58/JP60: 3-pin fans (JP54: Fan1, JP56: Fan2, JP58: Fan3,JP60: Fan4)
3. JP37/JP95/JP52/JP96: I^2C Connectors (JP37:I^2C1, JP95:I^2C2, JP52:I^2C3, JP96: I^2C4)
4. JP66/JP68/JP75/JP77: Sideband Headers (JP66: Sideband#1, JP68: Sideband #2, JP75: Sideband#3, JP77: Sideband#4)
5. J5-8, J10/J12/J14/J16, J22-J25, J26/J29/J30/J32: SAS 0-15 Connectors: SAS#0 (J5), SAS#1 (J6), SAS#2 (J7), SAS#3 (J8),SAS#4 (J10), SAS#5(J12), SAS#6 (J14), SAS#7 (J16),SAS#8 (J22), SAS#9 (J23), SAS#10 (J24), SAS#11 (J25),SAS#12 (J26), SAS#13 (J29), SAS#14 (J30), SAS#15 (J32).
6. JP26/JP47: Activity LED Headers (JP26: ACT_IN#1: SAS #0-SAS#7, JP47: ACT_IN#2: SAS#8-#15)
7. JP69/JP78: Upgrade Headers (JP69: Upgrade#1, JP78: Upgrade#2)
8. JP73/JP82: Upgrade Headers (JTAG#1, JTAG#2)
9. JP105/JP106: CD-ROM/Floppy Disk Power Connectors

A-3. Front Panel Connector Pin Definitions

1. Backplane Main Power Connectors (JP10, JP13, JP46, JP48) Pin Definitions

You must use the 4-pin power connectors to provide adequate power to the Backplane. See the table on the right for pin definitions.

12V 4-pin Power Connector Pin Definitions

Pins	Definition
1	+12V
2 & 3	Ground
4	+5V

2 3-pin Fan Headers (JP54/JP56/JP58/JP60) Pin Definitions

The 3-pin Fan Headers are located at JP54/JP56/JP58/JP60 on the front panel. To prevent overheat, please connect a 3-pin fan cable to each fan header. See the table on the right for pin definitions. (***Notes**:
1. The Fan Header uses DC power.
2. **Default:** Fan Enabled.)

Fan Header Pin Definitions

Pin#	Definition
1	Ground
2	+12V
3	Tachometer

3. I2C Connectors: (JP37/JP95/JP52/JP96) Pin Definitions

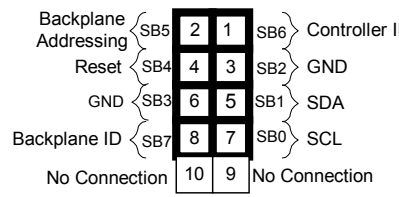
There are four I2C Connectors on the Backplane. See the table on the right for pin definitions.

I2C Pin Definitions

Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

4. Sideband Headers: (JP66/JP68/JP75/JP77) Pin Definitions

The Sideband Headers are located at JP66/JP68/JP75/JP77 on the front panel. For SAS-II to work properly, please connect an 8-pin Sideband cable to each Sideband header as shown on the right. See the table for pin definitions.
(***Default**: Open)



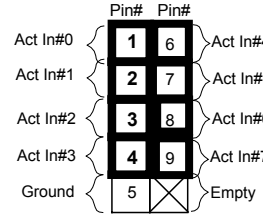
5. SAS Connectors:

J5:SAS#0, J6:SAS#1, J7:SAS#2, J8:SAS#3, J10: SAS#4, J12: SAS#5, J14: SAS#6, J16:SAS#7, J22: SAS#8, J23: SAS#9, J24: SAS#10, J25: SAS#11, J26: SAS#12, J29: SAS#13, J30: SAS#14, J32: SAS#15.

6.a. Activity LED Header (Act-In1: #0-#7): JP26 Pin Definitions

The Activity LED Header, located at JP26 on the front panel, transmits signals to indicate the activity status of each SAS slot from Slot0 to Slot7. For the Activity LED Header to work properly, please connect an 8-pin LED cable to Pin 1 to Pin 4 and Pin 6 to Pin 9 of JP26 as shown on the right. (*__Default__: Open)

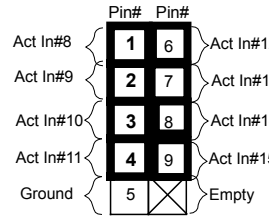
Act-In#1:JP26 (SAS#0-7)
SAS Activity LED



6.b. Activity LED Header (Act-In2: #8-#15): JP47 Pin Definitions

The Activity LED Header, located at JP47 on the front panel, transmits signals to indicate the activity status of each SAS slot from Slot8 to Slot15. For the Activity LED Header to work properly, please connect an 8-pin LED cable to Pin 1 to Pin 4 and Pin 6 to Pin 9 of JP47 as shown on the right. (*__Default__: Open)

Act-In#2:JP47 (SAS#8-15)
SAS Activity LED



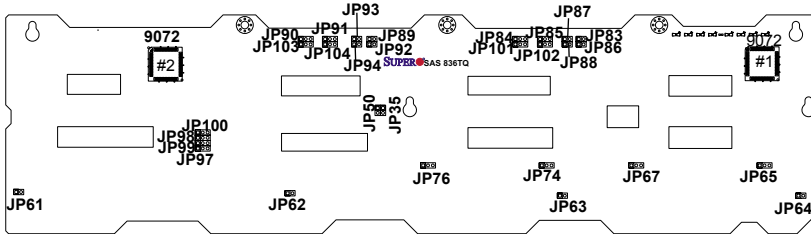
9. CD-ROM/Floppy 4-pin Power Connectors (JP105, JP106) Pin Definitions

You must use the 4-pin power connectors: JP105, JP106 to provide power to the CD-ROM and Floppy Drives. See the table on the right for pin definitions.

CD-ROM/FDD 4-pin PWR Connector Pin Definitions	
Pins	Definition
1	+5V
2 & 3	Ground
4	+12V

B. Front Jumpers

B-1 Front Jumper Locations



B-2 Front Jumper Settings

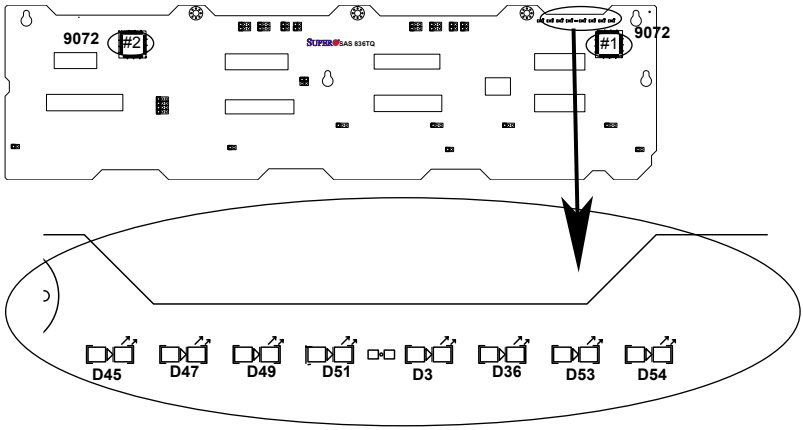
B-2.1 MG9072 Reset & Fan Jumper Settings

MG 9072 Reset & Fan Jumper Settings		
Jumper	**Setting**	**Note**
JP35	MG 9072#1 Reset if short (*Default: Open)	Short: Reset
JP50	MG 9072#2 Reset if short (*Default: Open)	Short: Reset
JP61 JP62 JP63 JP64 (***Note**)	JP61: Fan 1 Select JP62: Fan 2 Select JP63: Fan 3 Select JP64: Fan 4 Select (*Default: On)	On: Fan Enabled (w/Fan) Off: Fan Disabled (w/o Fan)
JP97 JP98 JP99 JP100 (***Note**)	JP97: Fan 1 Enabled JP98: Fan 2 Enabled JP99: Fan 3 Enabled JP100: Fan 4 Enabled (*Default: Enabled)	Pins 1-2: Fan Enabled (with Fan) Pins 2-3: Fan Disabled (without Fan)
***Note**: When a Fan Select is set to "On", please set the corresponding Fan Jumper to Pins 1-2: Enabled. (eg: For Fan1: JP61:On, JP97: 1-2; JP61: Off, JP97: 2-3.)		

B-2.2 SES-2 Jumper Settings

SES-2 Jumper Settings				
Jumper	**Setting**	**Note**	**SGPIO Setting**	**I^2C Setting (*Default)**
JP65 JP67 JP74 JP76	JP65: BP_IDSDIN#1 (9072#1) JP67: BP_IDSDIN#2 (9072#1) JP74: BP_IDSDIN#3 (9072#2) JP76: BP_IDSDIN#4 (9072#2) (*Default: 2-3)	1-2: SGPIO 2-3: I^2C	1-2	2-3
JP85 JP102	JP85: I^2C BP_ID#1(9072#1) (Default: 1-2) JP102: I^2C BP_ID#2 (9072#1) (*Default: 2-3)	1-2: ID#0 2-3: ID#1		
JP91 JP104	JP91: I^2C BP_ID#3 (9072#2) (Default: 1-2) JP104: I^2C BP_ID#4 (9072#2) (*Default: 2-3)	1-2: ID#0 2-3: ID#1		
JP83 JP86 JP89 JP92	I^2C Reset#1 I^2C Reset#2 I^2C Reset#3 I^2C Reset#4 (*Default: On)	On: I^2C Off: SGPIO	Off	On
JP87 JP88 JP93 JP94	I^2C Reset_SDOUT#1(9072#1) I^2C Reset_SDOUT#2(9072#1) I^2C Reset_SDOUT#3(9072#2) I^2C Reset_SDOUT#4(9072#2) (*Default: Off)	On: SGPIO Off: I^2C	On	Off
JP84 JP101	I^2C CTRL_ID#1(9072#1) I^2C CTRL_ID#2 (9072#1) (*Default: 2-3)	1-2: SGPIO 2-3: I^2C	1-2	2-3
JP90 JP103	I^2C CTRL_ID#3(9072#2) I^2C CTRL_ID#4 (9072#2) (*Default: 2-3)	1-2: SGPIO 2-3: I^2C	1-2	2-3

B-3 Front Panel LED Locations



B-4 Front Panel LED Indicators: the AMI MG9072 SES-2 Controller (SCSI Enclosure Services-2) LED Indicators

The AMI MG 9072 allows the system to use a set of pre-defined SES commands to monitor the status of disk drives and provide disk drive information to the user through LED indicators and alarms/buzzers. (*Note: This function is available only when a RAID controller with a RAID set is present and enabled. Please refer to the table below for the information on SES-2 LED Indicators.)

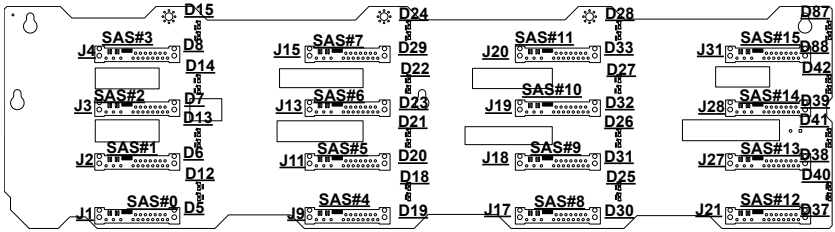
Front LED	State	Specification
D45	On	Fan#1 Failure
D47	On	Fan#2 Failure
D49	On	Fan#3 Failure
D51	On	Fan#4 Failure
D3	On	Alarm#1 (Buzzer#1)
D36	On	Alarm#2 (Buzzer#2)
D53	On	+5V Power On
D54	On	+12V Power On

Failure LED Patterns with SMC's Onboard SAS AIC-9410 (I^2C) Controller		
Status	**Red LED**	**Buzzer**
Drive Failure	Solid On	On
Rebuilding	Blinking @ 1Hz	Off
Rebuilding Completed	Off	Off
Hot Spare	Blink Twice and One Stop @ 1Hz	Off
Identifying	Blinking @ 4Hz	Off
Testing Buzzer	Off	On
Overheat	On	On
Fan Failure	On	On

C. Rear Connectors and LED Indicators

C-1 Rear Connector/LED Locations

Rear View



C-2 Rear Connectors

J1	SAS#0	J9	SAS#4	J17	SAS#8	J21	SAS#12
J2	SAS#1	J11	SAS#5	J18	SAS#9	J27	SAS#13
J3	SAS#2	J13	SAS#6	J19	SAS#10	J28	SAS#14
J4	SAS#3	J15	SAS#7	J20	SAS#11	J31	SAS#15

C-3 Rear LED Indicators--SAS Drive Failure LEDs

D5	SAS#0 Failure	D19	SAS#4 Failure	D30	SAS#8 Failure	D37	SAS#12 Failure
D6	SAS#1 Failure	D20	SAS#5 Failure	D31	SAS#9 Failure	D38	SAS#13 Failure
D7	SAS#2 Failure	D23	SAS#6 Failure	D32	SAS#10 Failure	D39	SAS#14 Failure
D8	SAS#3 Failure	D29	SAS#7 Failure	D33	SAS#11 Failure	D88	SAS#15 Failure

C-4 Rear LED Indicators--SAS Drive Activity LEDs

D12	SAS#0 Active	D18	SAS#4 Active	D25	SAS#8 Active	D40	SAS#12 Active
D13	SAS#1 Active	D21	SAS#5 Active	D26	SAS#9 Active	D41	SAS#13 Active
D14	SAS#2 Active	D22	SAS#6 Active	D27	SAS#10 Active	D42	SAS#14 Active
D15	SAS#3 Active	D24	SAS#7 Active	D28	SAS#11 Active	D87	SAS#15 Active