



Jumpers & LEDs (continued)

P1 Ethernet LEDs

I/O bracket connector P1 consists of two RJ-45 network connectors for Ethernet LAN1 and LAN2. Each LAN interface connector has two LEDs that indicate activity status and Ethernet connection speed. Listed below are the possible LED conditions and status indications for LAN1 and LAN2:

LED/Connector	Description
Activity LED	Green LED which indicates network activity. This is the upper LED on the LAN connector (i.e., toward the memory sockets).
Off	No current network transmit or receive activity
On (flashing)	Indicates network transmit or receive activity.
Speed LED	Green LED which identifies the connection speed. This is the lower LED on the LAN connector (i.e., toward the edge connectors).
Off	Indicates a valid link at 1000-Mb/s
On	Indicates a valid link at 100-Mb/s.
RJ-45 Network Connectors	The RJ-45 network connector requires a Connectors category 5 (CAT5) unshielded twisted-pair (UTP) 2-pair cable for a 100-Mb/s network connection or a category 3 (CAT3) or higher UTP 2-pair cable for a 10-Mb/s network connection. A category 5e (CAT5e) or higher UTP 2-pair cable is recommended for a 1000-Mb/s (Gigabit) network connection.

Backplane LAN LED

The backplane LAN LED (LED11) is a green LED located near PCI Express edge connector C and directly above the lower left anchor of the MCH heat sink. This LED indicates the status of communication between the SHB and the backplane as shown below:

LED Status	Description
Off	Indicates the LAN is inactive and link communications have not been established.
On (flashing)	Indicates that data is being transferred between the SHB and the backplane.
On (solid)	Indicates the LAN has a valid link and is ready for data transfers.

Power On LED

The Power On LED (LED11) is a red LED located at the center bottom of the SHB and is used to indicate the presence of the VCC voltage needed by the TQ9's DDR memory. When the LED is on this indicates that VCC_DDR is present and at an acceptable level to drive the SHBs memory DIMMs.

POST Code LEDs

As the POST (Power On Self Test) routines are performed during boot-up, test codes are displayed on Port 80 POST code LEDs 1 through 8, which are located in the center of the board to the right of the processor and are numbered from top (1) to bottom (8). Refer to the board layout diagram for the exact location of the POST code LEDs.

These POST codes may be helpful as a diagnostic tool. Specific error codes are listed in Appendix A - BIOS Messages section of the TQ9 Technical Reference Manual, along with a chart to interpret the LEDs into hexadecimal format.



Jumpers & LEDs (continued)

CPU Throttling LED

The CPU throttling LED (LED9), which is located in the upper left corner of the TQ9, indicates the status of CPU thermal shutdown, as shown below:

LED Status	Description
Off	Indicates the CPU is operating within acceptable thermal levels.
On (flashing)	Indicates the CPU is throttling down to a lower operating speed due to rising CPU temperature.
On (solid)	Indicates the CPU has reached the thermal shutdown threshold limit. The SHB is still operating, but a thermal shutdown may soon occur.

NOTE: When a thermal shutdown occurs, the LED will stay on in systems using non- ATX/EPS power supplies. The CPU will cease functioning, but power will still be applied to the SHB. In systems with ATX/EPS power supplies, the LED will turn off when a thermal shutdown occurs because system power is removed via the ACPI soft control power signal S5. In this case, all SHB LEDs will turn off; however, stand-by power will still be present.



Connectors

NOTE:

Pin 1 on the connectors is indicated by the square pad on the PCB.

P20 - I/O Expansion Mezzanine Card Connector

76 pin controlled impedance connector,
 Samtec #MIS-038-01-FD-K

P1 - 10/100/1000Base-T Ethernet Connectors - LAN1/LAN2

Dual RJ-45 connector, Pulse #JG0-0024NL
 Each individual RJ-45 connector is defined as follows:

PIN	SIGNAL	PIN	SIGNAL
1A	L2_MDI0n	1B	L1_MDI0n
2A	L2_MDI0p	2B	L1_MDI0p
3A	L2_MDI1n	3B	L1_MDI1n
4A	L2_MDI1p	4B	L1_MDI1p
5A	L2_MDI2n	5B	L1_MDI2n
6A	L2_MDI2p	6B	L1_MDI2p
7A	L2_MDI3n	7B	L1_MDI3n
8A	L2_MDI3p	8B	L1_MDI3p
9A	VCC_1.8V	9B	VCC_1.8V
10A	GND_A	10B	GND_B

PIN	SIGNAL	PIN	SIGNAL
1	+12V	2	+5V_STANDBY
3	NC	4	+5V_STANDBY
5	NC	6	+5V_DUAL
7	NC	8	+5V_DUAL
9	NC	10	NC
11	NC	12	NC
13	ICH_SMI#	14	ICH_RCIN#
15	ICH_SIOPME#	16	ICH_A20GATE
17	Gnd	18	Gnd
19	L_FRAME#	20	L_AD3
21	L_DRQ1#	22	L_AD2
23	L_DRQ0#	24	L_AD1
25	SERIRQ	26	L_AD0
27	Gnd	28	Gnd
29	PCLK14SIO	30	PCLK33LPC
31	Gnd	32	Gnd
33	SMBDATA_RESUME	34	IPMB_DAT
35	SMBCLK_RESUME	36	IPMB_CLK
37	SALRT#_RESUME	38	IPMB_ALRT#
39	Gnd	40	Gnd
41	EXP_CLK100	42	EXP_RESET#
43	EXP_CLK100#	44	ICH_WAKE#
45	Gnd	46	Gnd
47	C_PE_TXP5	48	C_PE_RXP5
49	C_PE_TXN5	50	C_PE_RXN5
51	Gnd	52	Gnd
53	NC	54	NC
55	NC	56	NC
57	Gnd	58	Gnd

P5 - SPEAKER PORT CONNECTOR

4 pin single row header, Amp #640456-4

PIN	SIGNAL
1	Speaker Data
2	Key
3	Gnd
4	+5V

P9 - Analog Audio Connector

10 pin dual row header, Amp #1761610-3

PIN	SIGNAL	PIN	SIGNAL
1	NC	2	NC
3	Gnd	4	Gnd
5	Mic-L	6	Mic-R
7	Gnd	8	Gnd
9	HP_OUT_L	10	HP_OUT_R



Connectors (Continued)

P10 - External Reset Connector

2 pin single row header, Amp #640456-2

PIN	SIGNAL
1	Gnd
2	Reset In

P12 - Hard Drive LED Connector

4 pin single row header, Amp #640456-4

PIN	SIGNAL
1	LED +
2	LED -
3	LED -
4	LED +

P15 - Video Interface Connector

15 pin HD15 connector, Kycon K31X-E15S-N

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
1	Red	6	Gnd	11	NC
2	Green	7	Gnd	12	EEDI
3	Blue	8	Gnd	13	HSYNC
4	NC	9	+5V	14	VSYNC
5	GND	8	Gnd	14	EECS

P17 - Universal Serial Bus (USB) Connector

8 pin dual row header, Molex #702-46-0801
 (+5V fused with self-resetting fuses)

PIN	SIGNAL	PIN	SIGNAL
1	+5V - USB2	2	+5V - USB3
3	USB2-	4	USB3-
5	USB2+	6	USB3+
7	Gnd - USB2	8	Gnd - USB3

P20 – (cont.)

59	NC	60	NC
61	NC	62	NC
63	Gnd	64	Gnd
65	NC	66	NC
67	NC	68	NC
69	Gnd	70	Gnd
71	+3.3V	72	+5V
73	+3.3V	74	+5V
75	+3.3V	76	+5V

P21 - POWER GOOD LED

2 pin single row header, Amp #640456-2

PIN	SIGNAL
1	LED -
2	LED +

P27 - SATA PORT1

7 pin vertical connector, Molex #67491-0031

PIN	SIGNAL	PIN	SIGNAL
1	Gnd	5	RX-
2	TX+	6	RX+
3	TX-	7	Gnd
4	Gnd		

P28 - SATA PORT2

7 pin vertical connector, Molex #67491-0031

PIN	SIGNAL	PIN	SIGNAL
1	Gnd	5	RX-
2	TX+	6	RX+
3	TX-	7	Gnd
4	Gnd		



Connectors (Continued)

P17A - UNIVERSAL SERIAL BUS (USB) CONNECTOR

USB vertical connector, Molex #47500-0001
 (+5V fused with self-resetting fuse)

PIN	SIGNAL
1	+5V - USB0
2	USB0-
3	USB0+
4	Gnd - USB0

P17B - UNIVERSAL SERIAL BUS (USB) CONNECTOR

USB vertical connector, Molex #47500-0001
 (+5V fused with self-resetting fuse)

PIN	SIGNAL
1	+5V - USB1
2	USB1-
3	USB1+
4	Gnd - USB1

P17C - UNIVERSAL SERIAL BUS (USB) CONNECTOR

8 pin dual row header, Molex #702-46-0801
 (+5V fused with self-resetting fuses)

PIN	SIGNAL	PIN	SIGNAL
1	+5V - USB4	2	+5V - USB5
3	USB4-	4	USB5-
5	USB4+	6	USB5+
7	Gnd - USB4	8	Gnd - USB5

P31 - SATA PORT3

7 pin vertical connector, Molex #67491-0031

PIN	SIGNAL	PIN	SIGNAL
1	Gnd	5	RX-
2	TX+	6	RX+
3	TX-	7	Gnd
4	Gnd		

P32 - SATA PORT4

7 pin vertical connector, Molex #67491-0031

PIN	SIGNAL	PIN	SIGNAL
1	Gnd	5	RX-
2	TX+	6	RX+
3	TX-	7	Gnd
4	Gnd		

P40 - Audio Codec

16-pin vertical connector, 3M #N2516-6002RB

PIN	SIGNAL	PIN	SIGNAL
1	HDA0_BCLK	2	Gnd
3	HDA0_RST#	4	3.3V
5	HDA0_SYNC	6	Gnd
7	HDA0_SDOUT	8	3.3V
9	HDA0_SDIN0	10	12V
11	NC	12	NC
13	NC	14	3.3V
15	NC	16	Gnd



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Connectors (Continued)

P17D - UNIVERSAL SERIAL BUS (USB) CONNECTOR

8 pin dual row header, Molex #702-46-0801
(+5V fused with self-resetting fuses)

PIN	SIGNAL	PIN	SIGNAL
1	+5V - USB6	2	+5V - USB7
3	USB6-	4	USB7-
5	USB6+	6	USB7+
7	Gnd - USB6	8	Gnd - USB7

P18 - SYSTEM HARDWARE MONITOR CONNECTOR

4 pin single row header, AMP #640456-4

PIN	SIGNAL
1	Gnd
2	GPO (General Purpose Output)
3	CI (Chassis Intrusion Input)
4	OVT (Over Temperature)

P19 - CPU FAN

3 pin single row header, Molex #22-23-2031

PIN	SIGNAL
1	Gnd
2	+12V
3	Fan Tach



Memory

The Double Data Rate (DDR2) memory interface is a dual-channel interface which supports up to 8GB of memory and supports memory transfer rates of 800MHz. Each of the channels (A and B) terminates with two dual in-line memory module (DIMM) socket. The System BIOS automatically detects memory type, size and speed.

The SHB uses industry standard gold finger memory modules, which must be PC2-6400 compliant and have the following features:

- Gold-plated contacts
- Non-ECC (64-bit) DDR2 memory
- Unbuffered configuration

The following DIMM sizes are supported:

FSB	DIMM Type	Width	Component Density
1333	PC2-6400	x8, x16	256MB, 512MB, 1GB, 2GB
1066	PC2-6400	x8, x16	256MB, 512MB, 1GB, 2GB
800	PC2-6400	x8, x16	256MB, 512MB, 1GB, 2GB
667	PC2-6400	x8, x16	256MB, 512MB, 1GB, 2GB

NOTE 1: To maximize system performance and reliability, Trenton recommends using DIMMs that support the Serial Presence Detect (SPD) data structure. All memory modules must have gold contacts.

NOTE 2: Double-sided DIMMS with a x16 organization are not supported.

NOTE 3: To minimize memory channel errors regardless of the type of memory module used; Trenton recommends memory DIMMs with a memory clock cycle specification of ten (10).

Trenton's TQ9 supports Interleaved and Asymmetric memory operations. The mode of memory operation is determined by how the DIMMs are populated. Listed below are descriptions of the Interleaved and Asymmetric memory operations.

Interleaved Mode - This is the mode of operation that enables the highest memory interface speed and bandwidth throughput capability. Often times this mode of operation is referred to as "dual-channel mode". Interleaved mode occurs when using two or four DIMM modules with equal memory capacities. The DIMM technology and device width can vary but the installed memory capacity for each channel must be equal. If different speed DIMMs are used in each channel then the slowest DIMM will determine the memory interface speed.

Asymmetric Mode - A memory module can be installed in only one DIMM socket. If only one DIMM module is used, it must be populated in either DIMM socket BKA1 or BKB1. From a system operational standpoint, asymmetric mode functions as a "single-channel" memory interface.

Asymmetric mode occurs when using either a single DIMM module or multiple DIMMs with unequal memory capacities. The DIMM technology and device width can vary in each channel and if different speed DIMMs are used in each channel then the slowest DIMM will determine the memory interface speed.

The TQ9's memory interface operates at maximum bandwidth with two DIMMs of the same size installed in DIMM Socket BKA1 and BKB1, but the DIMMs may differ in technology (component density) and/or device width. Populating identical DIMMs in all four DIMM sockets will also achieve maximum memory bandwidth operation. For example, when using a single PC2-6400 DIMM, the peak memory interface bandwidth is 6.4GB/s, and placing a PC2-6400 DIMM in each socket of the two memory channels produces a TQ9 theoretical peak memory bandwidth of 12.8GB/s.

[TQ9 Product Detail.](#)