

Intel[®] Server System SR1520ML

Technical Product Specification

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Table of Contents

1. Introduction	1
1.1 System View	1
1.2 Chassis Dimensions	1
1.3 Chassis Dimensions	2
1.4 Server Board.....	3
1.5 Hard Drive and Peripheral Bays	3
1.6 System Cooling.....	4
1.7 Rack and Cabinet Mounting Options	4
2. Power Sub-System.....	5
2.1 Mechanical Specifications	5
2.2 Output Connectors.....	6
2.2.1 Baseboard Power Connector (P1).....	6
2.2.2 Baseboard Power Connector (P2).....	7
2.2.3 P3, P4 SATA HDD Power Connector	7
2.2.4 P5 Power Connector.....	8
2.3 AC Inlet Connector	8
2.3.1 AC Power Cord Specifications.....	8
2.4 Marking and Identification.....	9
2.5 AC Input Voltage.....	9
2.6 Output Power / Currents	9
2.7 Protection Circuits.....	10
2.8 Over-Current Limit (OCP)	10
2.9 Over-Voltage Protection (OVP)	11
2.10 Over-Temperature Protection (OTP)	11
3. Cooling Sub-System	12
3.1 System Fans.....	12
3.2 Fan and Air Duct Assembly	14
4. Peripheral and Hard Drive Support.....	15
4.1 Hard Drives.....	15
4.2 Intel® Z-U130 Value Solid State Drive	15
4.3 System Fan Connectors	15
5. Front Panel Control.....	18

5.1	External Buttons and LEDs.....	18
5.2	Internal Front Panel Connector.....	19
5.3	Internal USB Connector.....	20
6.	PCI Express* Riser Card and Assembly.....	21
7.	Supported Intel® Server Boards.....	23
8.	Environmental and Regulatory Specifications.....	24
8.1	System Level Environmental Limits.....	24
8.2	Product Regulatory Compliance.....	24
8.2.1	Product Safety Compliance.....	24
8.2.2	Product EMC Compliance.....	25
8.2.3	Certifications / Registrations / Declarations.....	25
8.2.4	Product Regulatory Compliance Markings.....	26
8.3	Electromagnetic Compatibility Notices.....	29
8.3.1	USA.....	29
8.3.2	FCC Verification Statement.....	29
8.3.3	ICES-003 (Canada).....	30
8.3.4	Europe (CE Declaration of Conformity).....	30
8.3.5	Japan EMC Compatibility.....	30
8.3.6	BSMI (Taiwan).....	30
8.3.7	RRL (Korea).....	31
8.3.8	CNCA (CCC-China).....	31
8.4	Replacing the CMOS Battery.....	32
8.5	Serviceability and Availability.....	33
8.5.1	Product Ecology Requirements.....	33
8.6	Regulated Specified Components.....	34
	Appendix A: Integration and Usage Tips.....	35
	Glossary.....	36
	Reference Documents.....	37

List of Figures

Figure 1. Intel® Server System SR1520ML.....	1
Figure 2. Intel® Server System SR1520ML Major System Components	2
Figure 3. Back Panel Features	3
Figure 4. Intel® Server System SR1520ML Drive Bays	4
Figure 5. Power Supply Enclosure.....	5
Figure 6. AC Power Cord Specifications.....	8
Figure 7. Thermal Areas	12
Figure 8. Fan Locations	13
Figure 9. Fan and Air Duct Assembly	14
Figure 10. Data Cable Routing	16
Figure 11. Power Cable Routing.....	17
Figure 12. Front Panel Controls.....	18
Figure 13. 32-pin Front Panel Connector Pinout	20
Figure 14. 2x 5-pin USB 2.0 Front Panel Connector Pinout	20
Figure 15. PCI Express* Riser Card Assembly.....	21
Figure 16. 1U PCI Express* Riser Card Mechanical Drawing	22

List of Tables

Table 1. Intel® Server System SR1520ML	1
Table 2. Intel® Server System SR1520ML Cable Lengths	6
Table 3. P1 Main Power Connector Pinout	6
Table 4. P2 Main Power Connector Pinout	7
Table 5. P3 and P4 SATA HDD Power Connector Pinout	7
Table 6. P5 Power Connector	8
Table 7. AC Input Rating	9
Table 8. 600 Watt Load Ratings	9
Table 9. Over Current Protection (OCP)	10
Table 10. Over-Voltage Protection (OVP) Limits	11
Table 11. Fan List	12
Table 12. 8-pin Fan Connector Pin-out (J5K1, J5K2, J5K3)	15
Table 13. Front Panel LED Functions	18
Table 14. System Environmental Limits Summary	24

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1. Introduction

The Intel® Server System SR1520ML is a 1U server system containing two physical compute nodes. It will launch in October 2007 and is an ideal solution for the high-density HPC and internet portal server segment. The system includes two Intel® Server Boards X38ML and supports two fixed 2.5-inch SATA hard drives. The server boards and the server system have features that support the high-density server market.

This chapter provides a high-level overview of the system features. Greater detail for each major system component or feature is provided in the following chapters.

1.1 System View

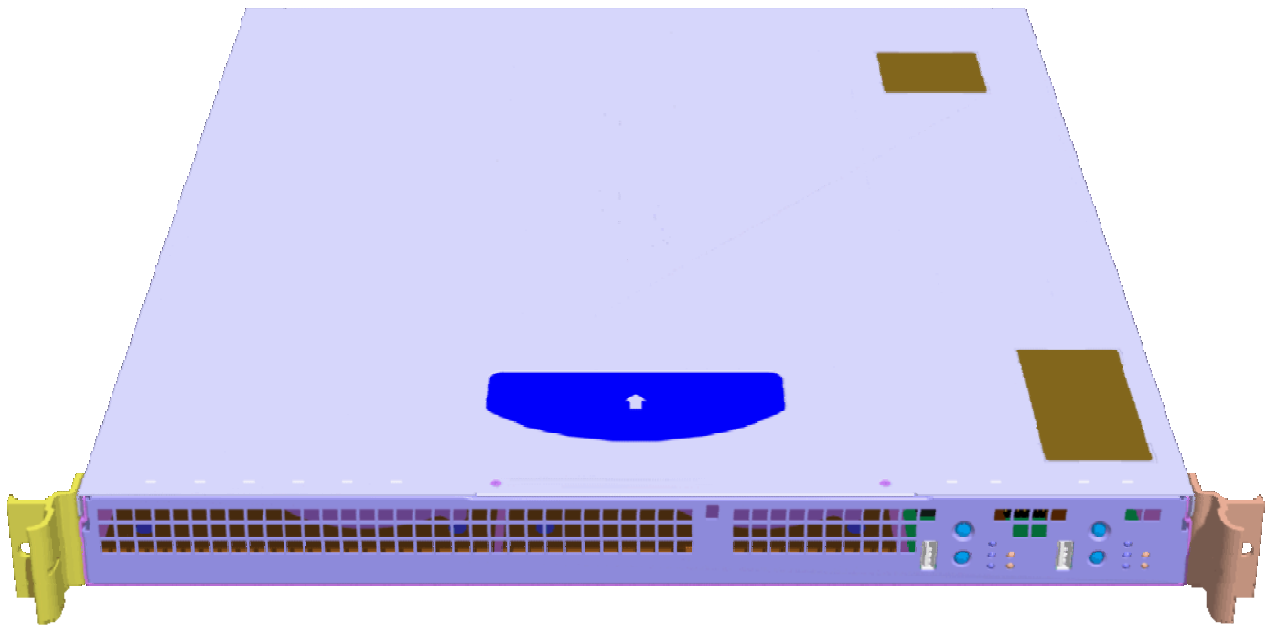


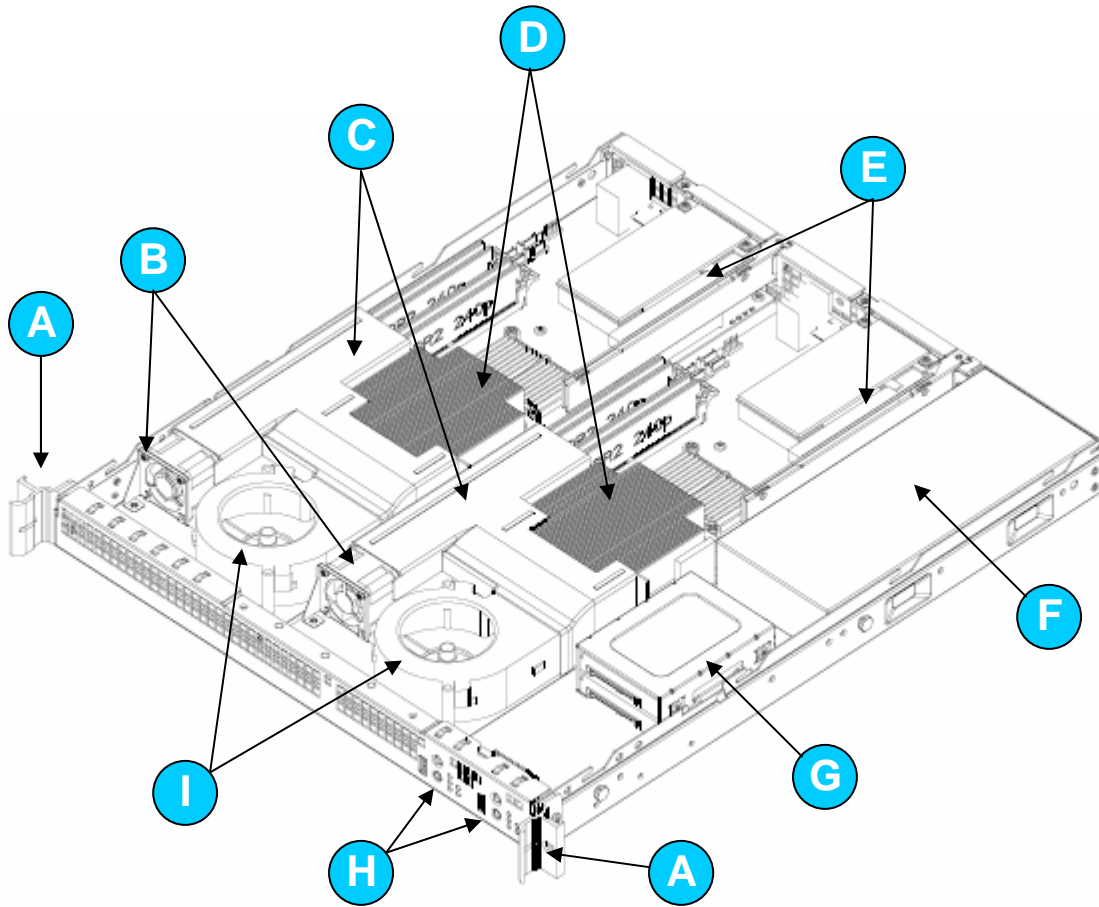
Figure 1. Intel® Server System SR1520ML

1.2 Chassis Dimensions

Table 1. Intel® Server System SR1520ML

Height	1.67 inches	42.42 mm
Width without rails	16.93 inches	430.02 mm
Depth	20 inches	508.00 mm
Maximum weight	28.66 lbs	13 kg

1.3 Chassis Dimensions



A	Rack handles (two)	F	Power supply
B	System memory cooling fan (two)	G	Hard drives Brackets (two)
C	Processor and memory air duct (two)	H	Control panel (one per board)
D	Processor Heat Sink (two)	I	System blower fans (two)
E	PCI add-in card bracket (two)		

Figure 2. Intel® Server System SR1520ML Major System Components

The I/O connector locations on the back of the system are pre-cut, so an I/O shield is not required. The EMI gasket is pre-installed to maintain electromagnetic interference (EMI) compliance levels. The layout is shown in figure 3.

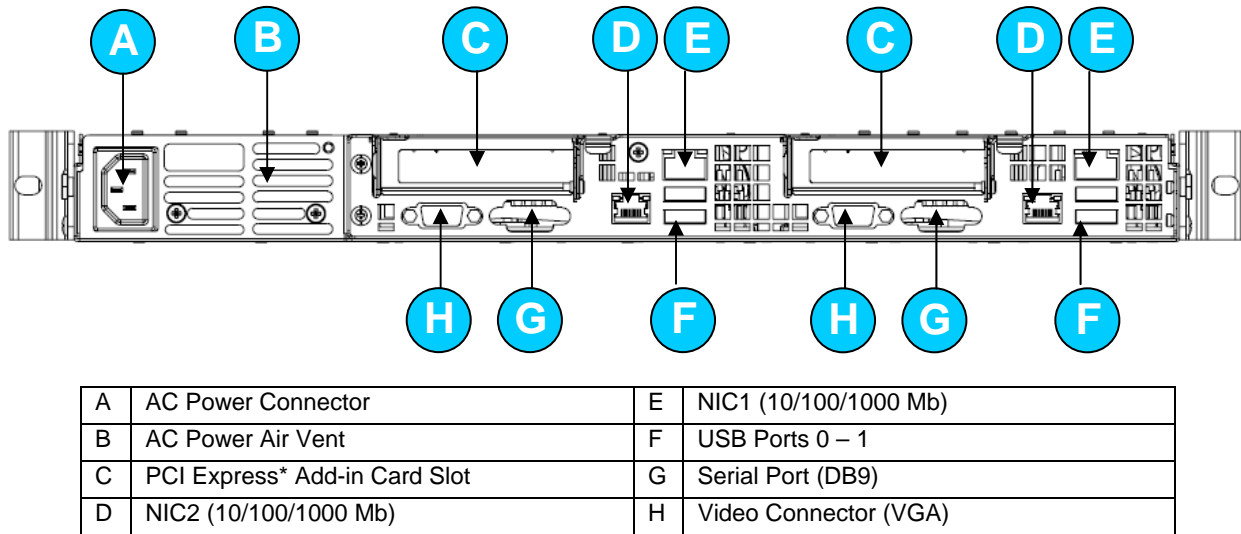


Figure 3. Back Panel Features

1.4 Server Board

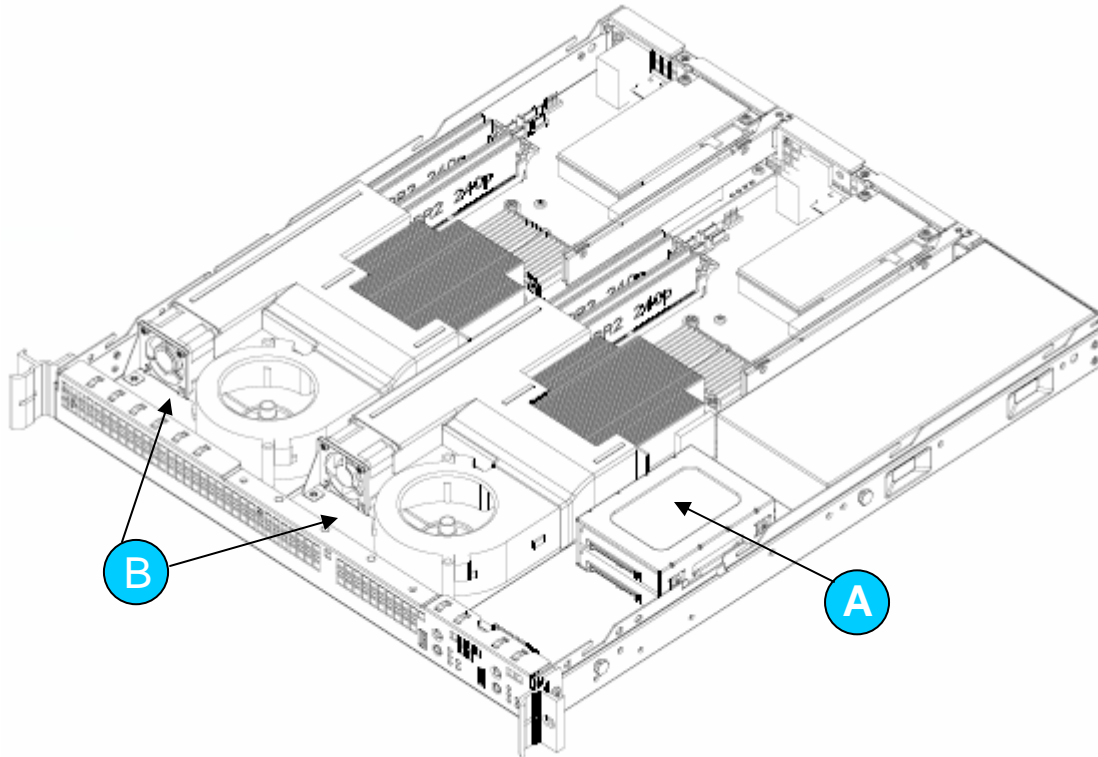
The Intel® Server System SR1520ML includes two Intel® Server Boards X38ML. Each board can be independently controlled via separate front panel interfaces. The system operates as two physical nodes in a 1U form factor. The system comes with two PCI Express* riser cards, each supporting a single x1, x4, x8 or x16 adapter.

For more information on the Intel® Server Board X38ML see the server board TPS at: <http://support.intel.com/support/motherboards/server/x38ml>

1.5 Hard Drive and Peripheral Bays

The server system supports up to two fixed 2.5-inch SATA hard drives. One Intel® Z-U130 Value Solid State Drive per board may also be installed. The Intel® Z-U130 Value Solid State Drive enables fast boot ability with customizable BIOS payloads. See section 4.2 for more details.

Note: There are no optical or floppy drive bays available in the system although both devices are supported via external USB connection.



A	2.5-inch HDD Bay 1 and 2
B	Intel® Z-U130 Value SSD mounting locations

Figure 4. Intel® Server System SR1520ML Drive Bays

1.6 System Cooling

One blower fan and one DIMM cooling fan are provided for each board. When external ambient temperatures remain within specified limits of 30°C, the cooling system provides sufficient air flow for all drive configurations, processors, supported memory, and add-in cards.

1.7 Rack and Cabinet Mounting Options

The server system supports 19-inch wide by up to 30-inch deep server cabinets. The system ships with a basic slide rail kit and also supports fixed mount and tool-less slide rail kits:

- A basic slide rail kit (product order code – AXXBASICRAIL) designed to mount the chassis into a standard (19-inch by up to 30-inch deep) EIA-310D compatible server cabinet and is included with the server system.
- A fixed mount relay rack / cabinet mount kit (Product order code - AXXBRACKETS) which can be configured to mount the system into either a 2-post or 4-post rack cabinet.
- A tool-less full extracting slide rail kit (product order code – AXXHERAIL) designed to support an optional cable management arm (product order code – AXXRACKCARM).

2. Power Sub-System

The power sub-system consists of one non-redundant 600-watt high efficiency power supply that drives both server boards and supported peripherals. An IEC connector is provided on the external face for AC input to the power supply. The power supply is cooled by two internal 40 x 40 x 28 mm fans.

2.1 Mechanical Specifications

The 1U 600-watt power supply is designed specifically for use in the Intel® Server System SR1520ML. The power supply dimensions are 240 mm x 100 mm x 40 mm and it has a wire harness for the DC outputs. The AC input plugs directly into the external face of the power supply.

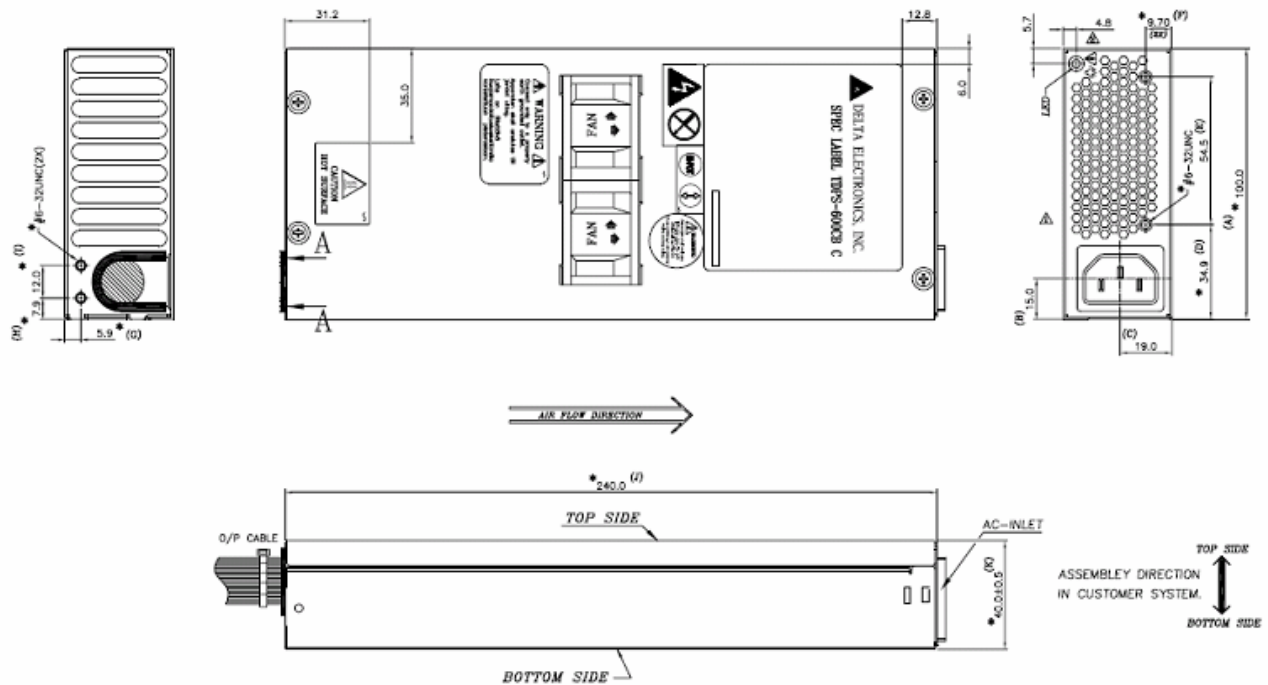


Figure 5. Power Supply Enclosure

Notes:

1. All dimensions are in mm.

2.2 Output Connectors

Listed or recognized component appliance wiring material (AVLV2), CN, rated min 80°C, 600VDC shall be used for all output wiring.

Table 2. Intel® Server System SR1520ML Cable Lengths

From	Length (mm)	To Connector #	Description
Power Supply cover exit hole	550	P1	Baseboard 1 Power Connector
Power Supply cover exit hole	730	P2	Baseboard 2 Power Connector
Power Supply cover exit hole	300	P3	HDD Power Connector
P3	50	P4	HDD Power Connector
Power Supply cover exit hole	860	P5	Not used

2.2.1 Baseboard Power Connector (P1)

- Connector housing: 18- Pin Molex Mini-Fit Jr. 39-01-2181 or equivalent
- Contact: Molex Mini-Fit, HCS, Female, Crimp 44476 or equivalent

Table 3. P1 Main Power Connector Pinout

Pin	Signal	18 AWG Color	Pin	Signal	18 AWG Color
1	+3.3 VDC	Orange	10	+3.3 VDC	Orange
2	COM	Black	11	-12 VDC	Blue
3	COM	Black	12	COM	Black
4	+5 VDC*	Red	13	PSO#	Green
5	5VSB	Purple	14	+5 VDC	Red
6	COM	Black	15	PWR OK	Gray
7	COM	Black	16	COM	Black
8	+12V1DC	Yellow	17	COM	Black
9	+12V1DC	Yellow	18	+12V3DC	Yellow/Blue Stripe

2.2.2 Baseboard Power Connector (P2)

- Connector housing: 18- Pin Molex Mini-Fit Jr. 39-01-2181 or equivalent
- Contact: Molex Mini-Fit, HCS, Female, Crimp 44476 or equivalent

Table 4. P2 Main Power Connector Pinout

Pin	Signal	18 AWG Color	Pin	Signal	18 AWG Color
1	+3.3 VDC	Orange	10	+3.3 VDC	Orange
2	COM	Black	11	-12 VDC	Blue
3	COM	Black	12	COM	Black
4	+5 VDC*	Red	13	PSON#	Green
5	5VSB	Purple	14	+5 VDC	Red
6	COM	Black	15	PWR OK	Gray
7	COM	Black	16	COM	Black
8	+12V2DC	Yellow/Black Stripe	17	COM	Black
9	+12V2DC	Yellow/Black Stripe	18	+12V3DC	Yellow/Blue Stripe

- 5V Remote Sense Double Crimped into pin 4, if required.
- 3.3V Remote Sense Double Crimped into pin 1, if required.
- PWR OK and -12V of P2 can be daisy chained from P1

2.2.3 P3, P4 SATA HDD Power Connector

- Connector housing: JWT A3811H00-5P (94V2) or equivalent;
- Contact: JWT A3811TOP-0D or equivalent

Table 5. P3 and P4 SATA HDD Power Connector Pinout

Pin	Signal	18 AWG Color
1	+3.3V	Orange
2	COM	Black
3	+5VDC	Red
4	COM	Black
5	+12V4DC	Yellow/White Stripe

2.2.4 P5 Power Connector

- Connector housing: 4- Pin Molex Mini-Fit Jr. 39-01-2045 or equivalent
- Contact: Molex Mini-Fit, HCS, Female, Crimp 44476 or equivalent

Table 6. P5 Power Connector

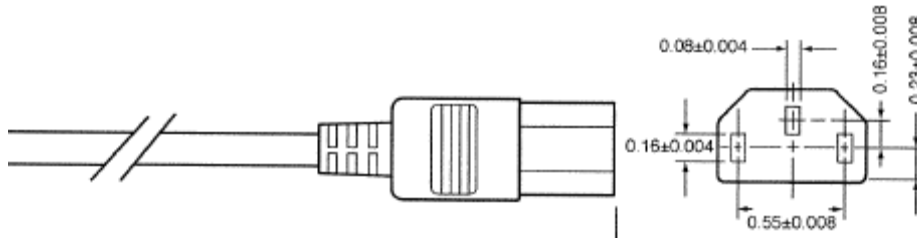
Pin	Signal	18 AWG Color
1	+12V4DC	Yellow/White Stripe
2	+12V4DC	Yellow/White Stripe
3	COM	Black
4	COM	Black

2.3 AC Inlet Connector

The AC input connector shall be an IEC 320 C-14 power inlet. This inlet is rated for 15A / 250VAC.

2.3.1 AC Power Cord Specifications

The AC power cord must meet the following specification requirements:



Cable Type	SJT
Wire Size	16 AWG
Temperature Rating	105° C
Amperage Rating	13A
Voltage Rating	125V

Figure 6. AC Power Cord Specifications

2.4 Marking and Identification

The power supply module marking supports the following requirements: safety agency requirements, government requirements (if required, e.g. point of manufacturing), power supply vendor requirements, and Intel manufacturing and field support requirements.

2.5 AC Input Voltage

The power supply must operate within all specified limits over the following input voltage range, shown in table below. Harmonic distortion of up to 10% of the **rated line voltage** must not cause the power supply to go out of specified limits. The power supply shall power off if the AC input is less than 75VAC +/-5VAC range. The power supply shall start up if the AC input is greater than 85VAC +/-4VAC. Application of an input voltage below 85VAC shall not cause damage to the power supply, including a fuse blow.

Table 7. AC Input Rating

Parameter	Minimum	Rated	V _{MAX}	I _{MAX}	Start up VAC	Power Off VAC
Voltage (110)	90 V _{rms}	100-127 V _{rms}	140 V _{rms}	6 A ^{1,3}	85VAC +/-4VAC	75VAC +/-5VAC
Voltage (220)	180 V _{rms}	200-240 V _{rms}	264 V _{rms}	3 A ^{2,3}		
Frequency	47 Hz	50/60	63 Hz			

Notes:

1. Maximum input current at low input voltage range shall be measured at 90VAC, at max load.
2. Maximum input current at high input voltage range shall be measured at 180VAC, at max load.
3. This requirement is not to be used for determining agency input current markings.

2.6 Output Power / Currents

The following table defines power and current ratings for this 600 W power supply. The combined output power of all outputs shall not exceed the rated output power. The power supply must meet both static and dynamic voltage regulation requirements for the minimum loading conditions.

Table 8. 600 Watt Load Ratings

Voltage	Minimum Continuous	Maximum Continuous	Peak
+3.3 V	1.5 A	20 A	
+5 V	1.0 A	24 A	
+12 V1	0.5 A	16 A	18 A
+12 V2	0.5 A	16 A	18 A
+12 V3	0.5 A	16 A	
+12 V4	0.5 A	16 A	
-12 V	0 A	0.5 A	
+5 VSB	0.1 A	3.0 A	3.5 A

Notes:

1. Maximum continuous total DC output power should not exceed 600W.
2. Peak load on the combined 12 V output shall not exceed 49A.
3. Maximum continuous load on the combined 12 V output shall not exceed 44A.
4. Peak total DC output power should not exceed 650W.
5. Peak power and current loading shall be supported for a minimum of 12 seconds.
6. Combined 3.3V and 5V power shall not exceed 150W.

2.7 Protection Circuits

Protection circuits inside the power supply shall cause only the power supply's main outputs to shutdown. If the power supply latches off due to a protection circuit tripping, an AC cycle OFF for 15 sec and a PSON[#] cycle HIGH for 1 sec shall be able to reset the power supply.

2.8 Over-Current Limit (OCP)

The power supply shall have current limits to prevent the +3.3V, +5V, and +12V outputs from exceeding the values shown in the table below. If the current limits are exceeded, the power supply shall shutdown and latch off. The latch will be cleared by toggling the PSON[#] signal or by an AC power interruption. The power supply shall not be damaged from repeated power cycling in this condition. -12V and 5VSB shall be protected under over-current or shorted conditions so that no damage can occur to the power supply. 5Vsb will be auto-recovered after removing the OCP limit.

Table 9. Over Current Protection (OCP)

Voltage	Over current Limit (lout limit)
+3.3V	110% minimum (= 22A) ; 150% maximum (= 30A)
+5V	110% min (= 26.4A); 150% max (= 36A)
+12V1	18A min; 20A max
+12V2	18A min; 20A max
+12V3	18A min; 20A max
+12V4	18A min; 20A max
-12V	0.625A min; 2.0A max
5VSB	6.0A max

2.9 Over-Voltage Protection (OVP)

The power supply over-voltage protection shall be locally sensed. The power supply shall shutdown and latch off after an over-voltage condition occurs. This latch shall be cleared by toggling the PSON[#] signal or by an AC power interruption. The table below contains the over-voltage limits. The values are measured at the output of the power supply's pins. The voltage shall never exceed the maximum levels when measured at the power pins of the power supply connector during any single point of fail. The voltage shall never trip any lower than the minimum levels when measured at the power pins of the power supply connector. The +5VSB rail will be auto-recovered after an over-voltage event occurs.

Table 10. Over-Voltage Protection (OVP) Limits

Output Voltage	Minimum (V)	Maximum (V)
+3.3V	3.9	4.5
+5V	5.7	6.2
+12V	13.3	14.5
-12V	-13.3	-14.5
+5VSB	5.7	6.5

2.10 Over-Temperature Protection (OTP)

The power supply will be protected against over-temperature conditions caused by loss of fan cooling or excessive ambient temperature. In an OTP condition the power supply will shutdown. When the power supply temperature drops to within specified limits, the power supply shall restore power automatically, while the 5VSB remains always on. The OTP circuit must have built in hysteresis such that the power supply will not oscillate on and off due to temperature recovering condition. The OTP trip level shall have a minimum of 4°C of ambient temperature hysteresis.

3. Cooling Sub-System

The cooling sub-system consists of two 97 mm blower fans, two 40 x 40 x 28 mm memory cooling fans and two CPU / memory air ducts between the three thermal partitions. These components are used to provide the necessary cooling and airflow to the system. A fan on the processor heat sink is not needed.

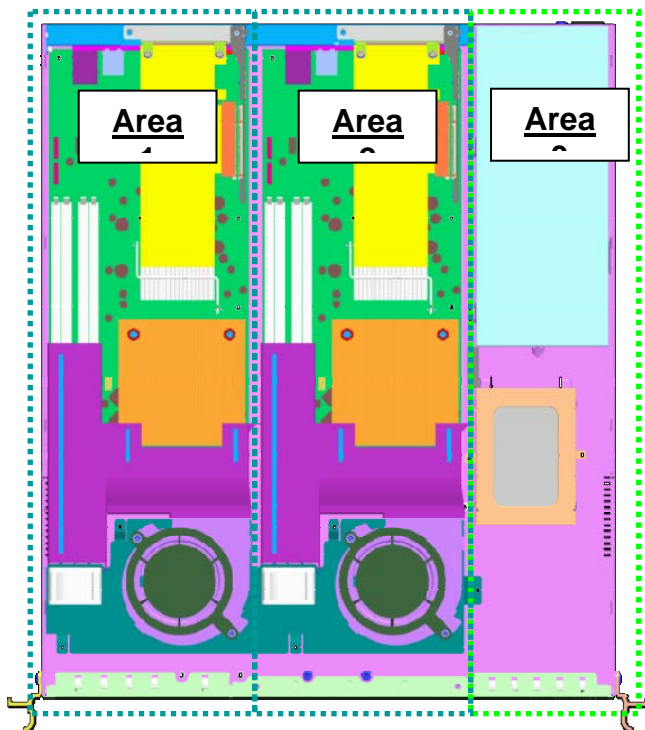


Figure 7. Thermal Areas

3.1 System Fans

Table 11. Fan List

Fan	Cooling Zone	Greatest Cooling Influence
System #1 Blower Fan	CPU/MCH	Primary cooling for board 1 CPU, MCH and add-in card
System #1 Cooling Fan	Memory	Primary cooling for board 1 memory DIMMS
System #2 Blower Fan	CPU/MCH	Primary cooling for board 2 CPU, MCH and add-in card
System #2 Cooling Fan	Memory	Primary cooling for board 2 memory DIMMS

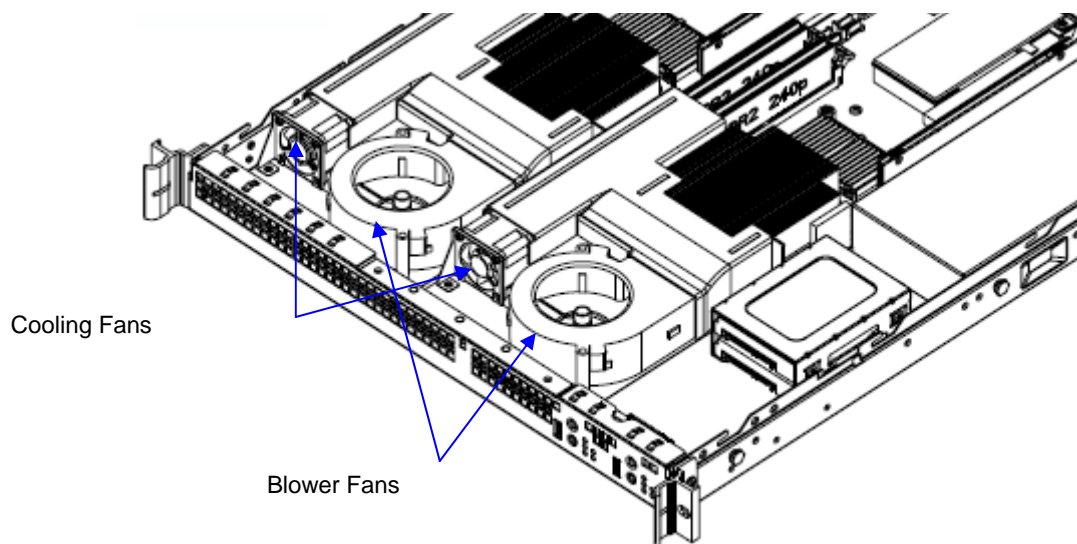


Figure 8. Fan Locations

Note: The Intel® Server System SR1520ML does not support redundant cooling. If a fan or blower fails, the system should be powered down as soon as possible to replace the failed unit. The system fans are not hot-swappable.

3.2 Fan and Air Duct Assembly

The chassis requires two air ducts, one per board, which direct airflow through CPU heat sink, MCH heat sink and PCI Express* add-in card area and the memory DIMM area. To maintain the necessary airflow within the system, the air duct and the top cover must be properly installed.

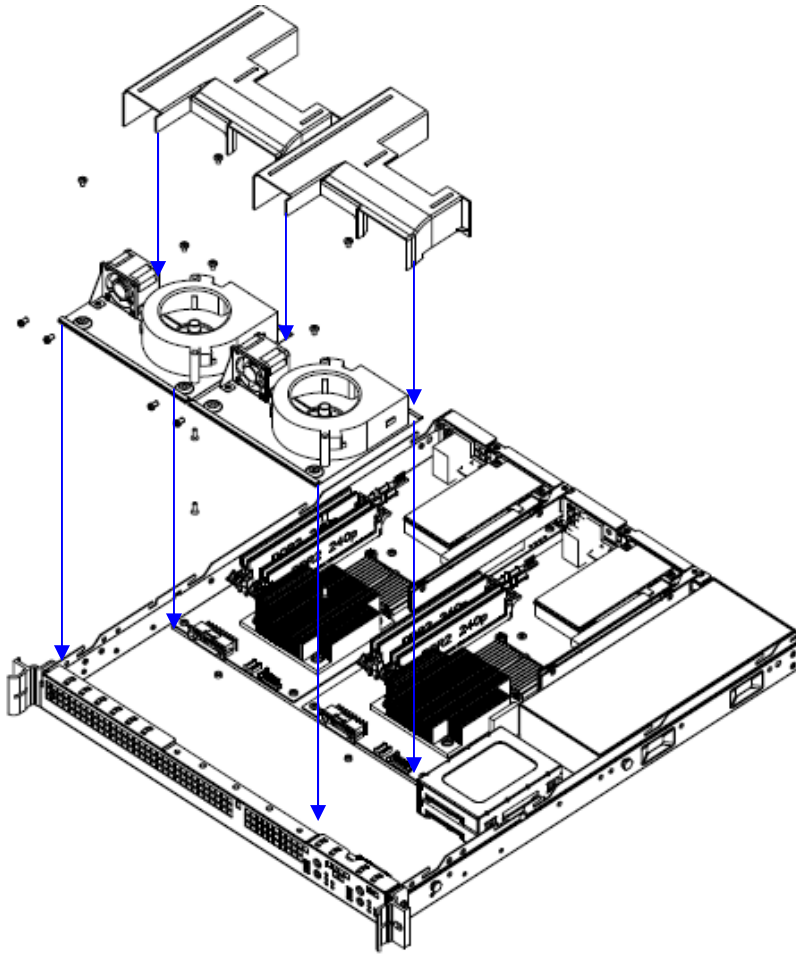


Figure 9. Fan and Air Duct Assembly

4. Peripheral and Hard Drive Support

Note: The Intel® Server System SR1520ML is not designed to accommodate any peripheral devices mounted inside the chassis other than those listed in section 4 of this document. Other peripherals may be supported via USB interface but will always be externally mounted. See the *Tested Hardware and Operating System (THOL)* document for the list of supported peripherals.

4.1 Hard Drives

The server system supports two fixed 2.5-inch hard drives, located toward the front of the chassis near the power supply unit. The fixed hard drive bays are designed to support SATA drives only. SATA cables and power cables are routed to each board as shown in figures 10 and 11.

4.2 Intel® Z-U130 Value Solid State Drive

Two Intel® Z-U130 Value Solid State Drives are supported as internally mounted devices (one per board). The Intel® Z-U130 Value Solid State Drive is a non-volatile RAM storage device that comes in 1 GB, 2 GB, and 4 GB sizes, with an 8 GB model launching in December 2007. It is targeted at hard drive replacement for diskless compute nodes, or fast-boot / fast application access usage models for HPC products. For more information on this product, see <http://www.intel.com/design/flash/nand/z-u130.htm>.

Two Intel® Z-U130 Value Solid State Drives can be mounted near the memory fans toward the front of the chassis. See figures 10 and 11 for mounting and cabling information.

4.3 System Fan Connectors

The server system has two Intel® Server Boards X38ML, each of which drives one CPU/MCH cooling blower fan and one memory cooling fan. Each server board has three 8-pin fan connectors, but uses only two connectors to cool the system. The pin-out for each connector is provided in the following table.

Table 12. 8-pin Fan Connector Pin-out (J5K1, J5K2, J5K3)

Pin	Signal Name	Type	Description
1	Ground	Power	GROUND is the power supply ground
2	Fan Power	Power	Fan Power +12VDC
3	Fan Tach1	Sense	FAN_TACH signal is connected to the SMC* SCH5027 or SCH5017 to monitor the fan speed.
4	PWM1	Control	Pulse Width Modulation – Fan speed Control signal
5	Ground	Power	GROUND is the power supply ground
6	Fan Power	Power	Fan Power +12VDC
7	Fan Tach2	Sense	FAN_TACH signal is connected to the SMC* SCH5027 or SCH5017 to monitor the fan speed. It use a different TACH input other than TACH1.
8	PWM1	Control	Pulse Width Modulation – Fan speed Control signal. It used the same PWM signal as PWM1

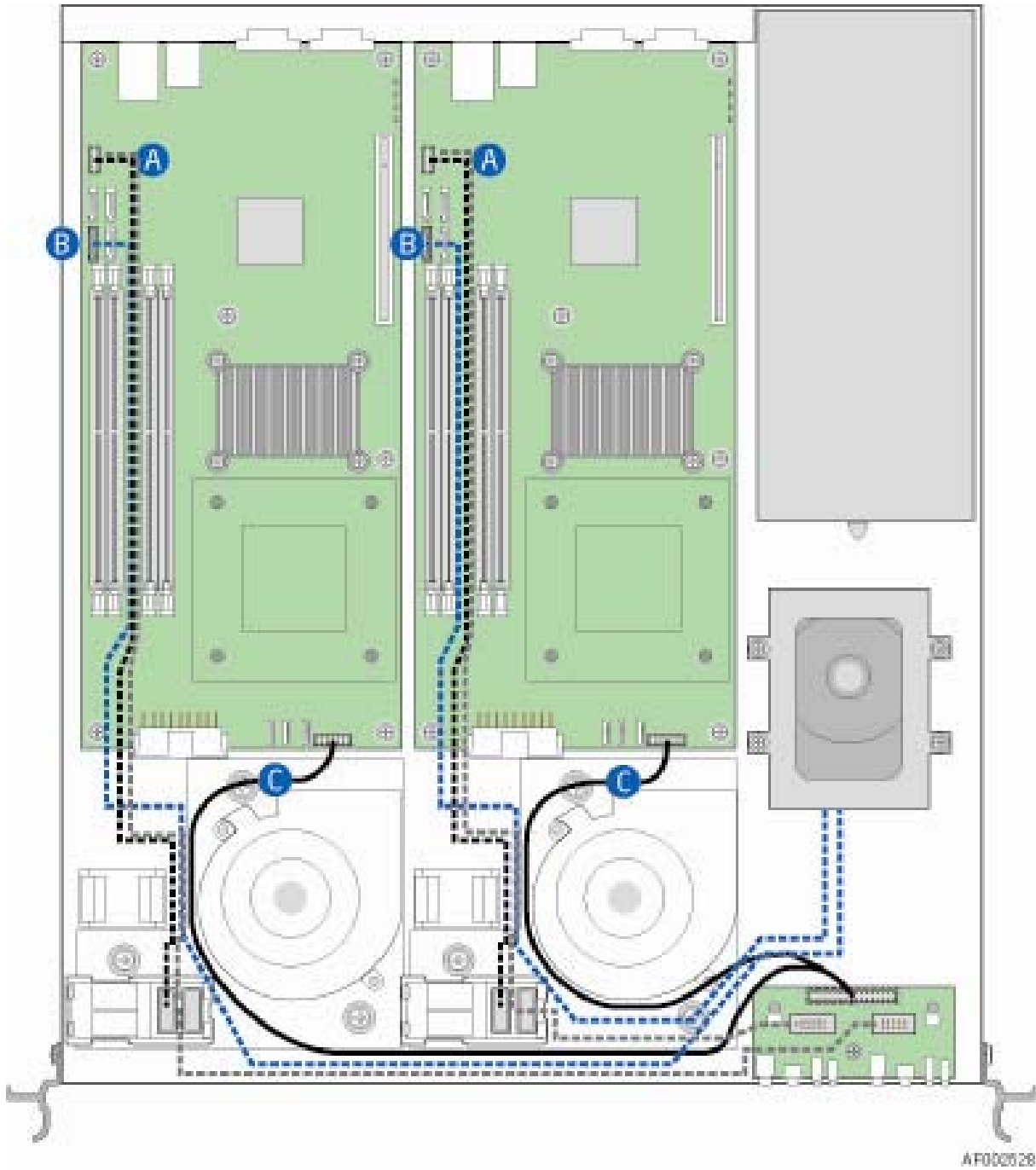


Figure 10. Data Cable Routing

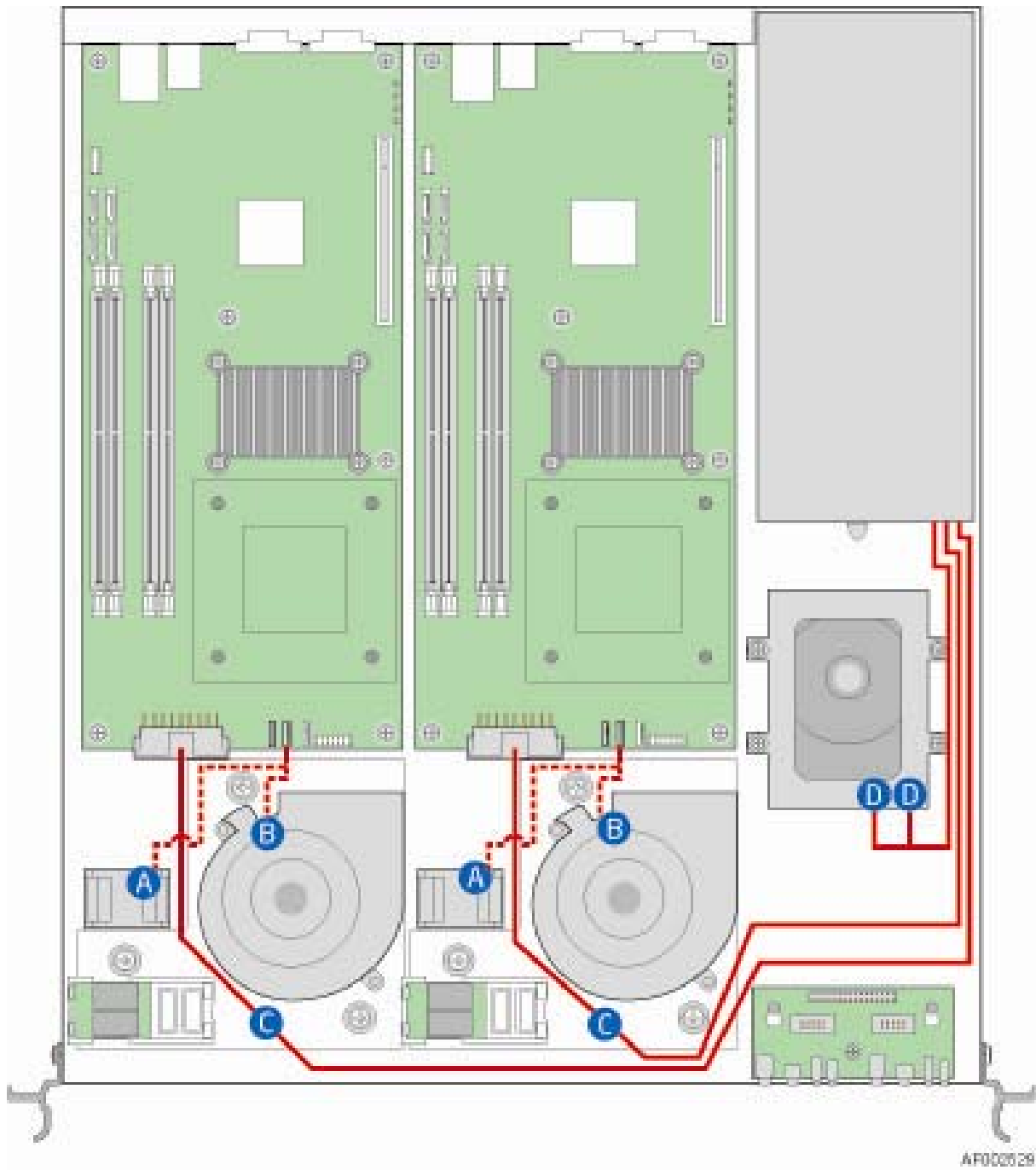
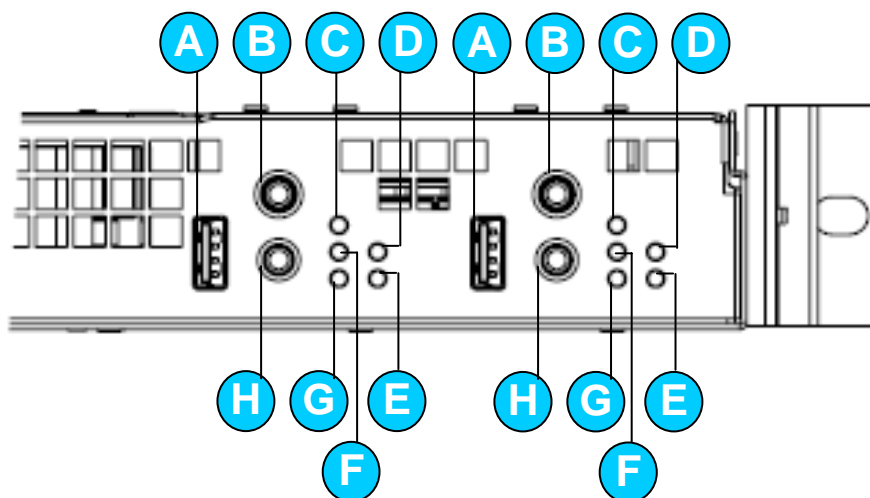


Figure 11. Power Cable Routing

5. Front Panel Control

5.1 External Buttons and LEDs

The front panel supports independent controls for each system node. Each node has its own power button, reset button, USB 2.0 connector, power/sleep LED, status LED, hard drive activity LED, NIC 1 activity LED and NIC 2 activity LED. The front panel controls come pre-assembled into the chassis. The left controls correspond to the server board on the left.



Item	Feature
A	USB port
B	Power button
C	DC Power Ready LED
D	NIC 1 LED
E	NIC 2 LED
F	Status LED
G	Hard Drive Activity LED
H	Reset Button

Figure 12. Front Panel Controls

Table 13. Front Panel LED Functions

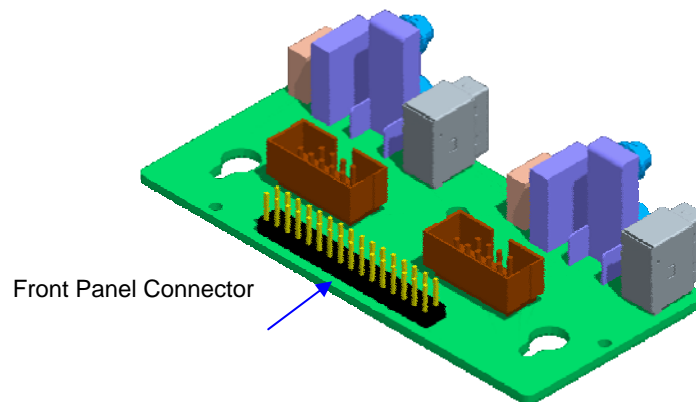
LED	Color	State	Description
DC Power Ready LED	Green	On	DC Power is ready to be applied to the board
	Green	Blink	Sleep S1
		Off	DC Power supply is in the 'Off' state (S4)
Status	Green	On	Board is 'ON' with no alarm
	Green	Blink	Board is 'ON', but degraded: some CPU fault, DIMM killed
	Amber	On	Critical alarm: Critical power module failure, critical fan failure, voltage (power supply), Voltage and thermal fault
	Amber	Blink	Non-Critical failure: Non-critical power and voltage

LED	Color	State	Description
		Off	Board is off with no alarm
HDD	Green	Blink	HDD Access
		Off	No access and no fault
LAN #1 Activity	Green	On	LAN link / No access
		Blink	LAN access
		Off	Idle
LAN #2 Activity	Green	On	LAN link / No access
		Blink	LAN access
		Off	Idle

The current limiting resistors for all front panel LEDs are located on the server board.

5.2 Internal Front Panel Connector

Communication from the front panel to the server boards is achieved via a single 32-pin cable which is bifurcated and connected directly to each server board's 16-pin front panel connector, marked J5K4 on each board. This cable is installed during system build.



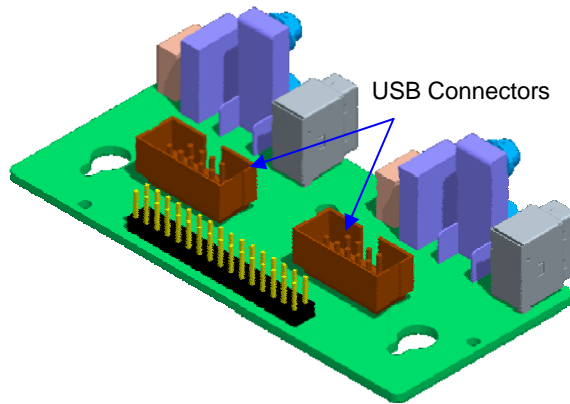
Pin	Board 1 Signal	Pin	Board 2 Signal
1	FP_P3V3_ANODE	17	FP_P3V3_ANODE
2	FP_NIC1_ACT_LED_R	18	FP_NIC1_ACT_LED_R
3	FM_GRN_BLNK_HDR	19	FM_GRN_BLNK_HDR
4	NIC_LINKA_LINKUP	20	NIC_LINKA_LINKUP
5	FP_HDD_LED_VCC	21	FP_HDD_LED_VCC
6	FP_NIC2_ACT_LED_R	22	FP_NIC2_ACT_LED_R
7	FM_HD_LED_FP_N	23	FM_HD_LED_FP_N
8	NIC_LINKB_LINKUP	24	NIC_LINKB_LINKUP
9	FP_PWR_BTN_R_N	25	FP_PWR_BTN_R_N
10	FP_RST_BTN_R_N	26	FP_RST_BTN_R_N
11	GND	27	GND
12	GND	28	GND
13	KEY	29	KEY

14	TEST PAD	30	TEST PAD
15	FM_LED_STATUS_AMB_N	31	FM_LED_STATUS_AMB_N
16	FM_LED_STATUS_GRN_N	32	FM_LED_STATUS_GRN_N

Figure 13. 32-pin Front Panel Connector Pinout

5.3 Internal USB Connector

Two USB 2.0 cables connect the 5-pin front panel USB ports to each server board USB connector, marked J1B3 on each board. These cables are installed during system build.



Pin	Board Signal	Pin	Board Signal
1	USB_FNT_PWR	6	NC
2	USB_FRONT1_INDUCTOR_DN	7	NC
3	USB_FRONT1_INDUCTOR_DP	8	NC
4	GND	9	NC
5	KEY	10	NC

Figure 14. 2x 5-pin USB 2.0 Front Panel Connector Pinout

6. PCI Express* Riser Card and Assembly

Each Intel® Server Board X38ML supports one PCI Express* riser slot that accepts one PCI Express* x16 low profile adapter card. The riser also accommodates PCI Express x8, x4, and x1 adapters.

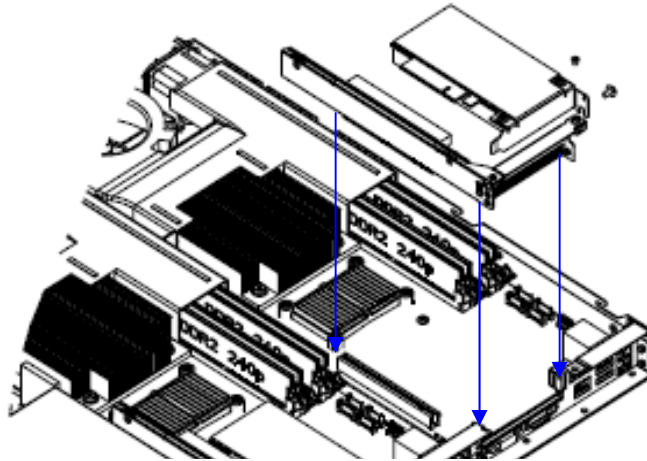


Figure 15. PCI Express* Riser Card Assembly

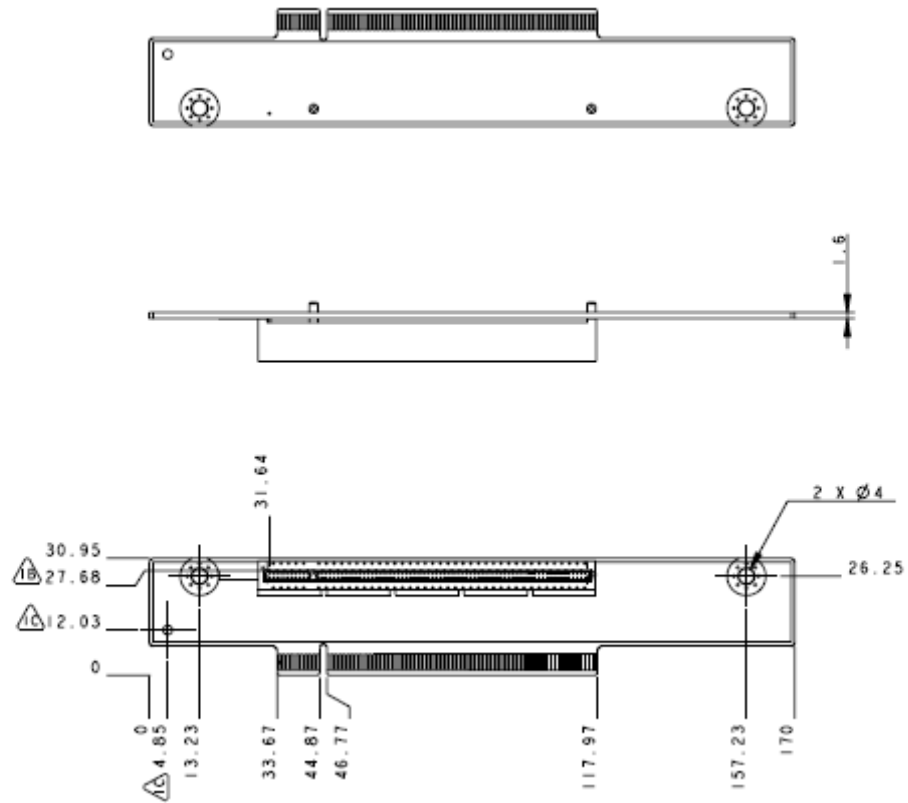


Figure 16. 1U PCI Express* Riser Card Mechanical Drawing

7. Supported Intel® Server Boards

The Intel® Server System SR1520ML is mechanically and functionally designed specifically for the Intel® Server Board X38ML. No other boards are supported by this chassis. See the *Intel® Server Board X38ML Technical Product Specification* for detailed server board information.
<http://support.intel.com/support/motherboards/server/X38ML>

8. Environmental and Regulatory Specifications

8.1 System Level Environmental Limits

Table 14. System Environmental Limits Summary

Parameter	Limits
Operating Temperature	+10°C to +30°C with the maximum rate of change not to exceed 10°C per hour
Non-Operating Temperature	-40°C to +70°C
Non-Operating Humidity	90%, non-condensing at 35°C
Acoustic noise	Sound Power: 7.0 BA in an idle state at typical office ambient temperature. (23 +/- 2 degrees C)
Shock, operating	Half sine, 2 g peak, 11 mSec
Shock, unpackaged	Trapezoidal, 25 g, velocity change 136 inches/sec (≥ 40 lbs to > 80 lbs)
Shock, packaged	Non-palletized free fall in height 24 inches (≥ 40 lbs to > 80 lbs)
Vibration, unpackaged	5 Hz to 500 Hz, 2.20 g RMS random
Shock, operating	Half sine, 2 g peak, 11 mSec
ESD	+/-15kV except I/O port +/-8KV per Intel Environmental test specification
System Cooling Requirement in BTU/Hr	1660 BTU/hour

8.2 Product Regulatory Compliance

8.2.1 Product Safety Compliance

The Intel® Server System SR1520ML complies with the following safety requirements:

- UL60950 – CSA 60950(USA / Canada)
- EN60950 (Europe)
- IEC60950 (International)
- CB Certificate & Report, IEC60950 (report to include all country national deviations)
- GS License (Germany)
- GOST R 50377-92 - License (Russia)
- Belarus License (Belarus)
- Ukraine License (Ukraine)
- CE - Low Voltage Directive 73/23/EEE (Europe)
- IRAM Certification (Argentina)
- GB4943- CNCA Certification (China)
- BSMI certification (Taiwan)

8.2.2 Product EMC Compliance

The Intel® Server System SR1520ML has been tested and verified to comply with the following electromagnetic compatibility (EMC).

- FCC (Class A Verification) – Radiated & Conducted Emissions (USA)
- ICES-003 – (Canada)
- CISPR 22 – Emissions (International)
- EN55022 - Emissions (Europe)
- EN55024 - Immunity (Europe)
- EN61000-3-2 - Harmonics (Europe)
- EN61000-3-3 - Voltage Flicker (Europe)
- CE – EMC Directive 89/336/EEC (Europe)
- VCCI Emissions (Japan)
- AS/NZS 3548 Emissions (Australia / New Zealand)
- BSMI CNS13438 Emissions (Taiwan)
- GOST R 29216-91 Emissions (Russia)
- GOST R 50628-95 Immunity (Russia)
- Belarus License (Belarus)
- Ukraine License (Ukraine)
- RRL MIC Notice No. 1997-41 (EMC) & 1997-42 (EMI) (Korea)
- GB 9254 - CNCA Certification (China)
- GB 17625 - (Harmonics) CNCA Certification (China)









8.2.3 Certifications / Registrations / Declarations



- UL Certification (US/Canada)
- CB Certification (International)
- CE Declaration of Conformity (CENELEC Europe)
- GS Certification (Germany)
- FCC/ICES-003 Class A Attestation (USA/Canada)
- VCCI Certification (Japan)
- C-Tick Declaration of Conformity (Australia/New Zealand)
- BSMI Certification (Taiwan)
- GOST R Certification / License (Russia)
- Belarus Certification / License (Belarus)
- Ukraine Certification (Ukraine)
- RRL Certification (Korea)
- IRAM Certification (Argentina)
- CNCA Certification (China)





- Ecology Declaration (International)

8.2.4 Product Regulatory Compliance Markings

The Intel® Server Chassis SR1520 has these regulatory marks.

Requirement	Description		P	R	Y/N/D	Src
Regulatory Markings	Argentina (IRAM Mark)		1	1	Y	
Regulatory Markings	Australia / NZ Ctick Mark		1	1	Y	
Regulatory Markings	Canada EMC Marking	CANADA ICES-003 CLASS A CANADA NMB-003 CLASSE A	1	1	Y	
Regulatory Markings	China (CNCA)	 声明 此为A级产品,在生活中,该产品可能会造成无线电干扰.在这种情况下,可能需要用户对其干扰采取可行的措施.	1	1	Y	
Regulatory Markings	Europe (CE Mark)		1	1	Y	
Regulatory Markings	Germany (GS Mark)		1	1	Y	
Regulatory Markings	Japan (VCCI Mark)	この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCCI-A	1	1	Y	
Regulatory Markings	Korea (RRL Mark)	 인증번호: CPU-SR1520 (A)	1	1	Y	
Regulatory Markings	Russia (GOST Mark)		1	1	Y	
Regulatory Markings	Taiwan (BSMI Mark)	 R33025 警告使用者： 這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策	1	1	Y	

Regulatory Markings	USA / Canada (UL Mark)		1	1	Y	
Regulatory Markings	USA (FCC Mark)	This device complies with Part 15 of the FCC Rules. Operation of this device is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept interference receive, including interference that may cause undesired operation.	1	1	Y	
Regulatory Markings	Country of Origin Mark	Made in XXXX	1	1	Y	
Regulatory Markings	Nordic Ground Marking	Line1 : "WARNING:" Swedish on line2: "Apparaten skall anslutas till jordat uttag, när den ansluts till ett nätverk." Finnish on line 3: "Laitte on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan." English on line 4: "Connect only to a properly earth grounded outlet."	1	1	Y	
Regulatory Markings (If multiple cords)	Multiple Power Cord	English: This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect (2) two power supply cords before servicing. Simplified Chinese: 注意： 本设备包括多条电源系统电缆。为避免遭受电击，在进行维修之前应断开两（2）条电源系统电缆。 Traditional Chinese: 注意： 本設備包括多條電源系統電纜。為避免遭受電擊，在進行維修之前應斷開兩（2）條電源系統電纜。 German: Dieses Geräte hat mehr als ein Stromkabel. Um eine Gefahr des elektrischen Schlages zu verringern trennen sie beide (2) Stromkabeln bevor Instandhaltung.	1	1	Y	
Regulatory Markings	WEEE Marking		1	1	Y	

Regulatory Markings	China RoHS		1	1	Y	
Regulatory Markings	China Recycling Package Marks	 Will be added on Package label	1	1	Y	
Regulatory Markings	Other Recycling Package Marks	 Will be added on Package label	1	1	Y	
	CA. Lithium Perchlorate insert	Perchlorate Material – Special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate This notice is required by California Code of Regulations, Title 22, Division 4.5, Chapter 33: Best Management Practices for Perchlorate Materials. This product / part includes a battery which contains Perchlorate material.	1	1	Y	
	Standard icon for Power button	 Should be attached on power button	1	1	Y	

8.3 Electromagnetic Compatibility Notices

8.3.1 USA

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124
1-800-628-8686

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

Only peripherals (computer input/output devices, terminals, printers, etc.) that comply with FCC Class B limits may be attached to this computer product. Operation with noncompliant peripherals is likely to result in interference to radio and TV reception.

All cables used to connect to peripherals must be shielded and grounded. Operation with cables, connected to peripherals that are not shielded and grounded may result in interference to radio and TV reception.

8.3.2 FCC Verification Statement

Product Type: SR1520ML

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Intel Corporation
5200 N.E. Elam Young Parkway
Hillsboro, OR 97124-6497

Phone: 1 (800)-INTEL4U or 1 (800) 628-8686

8.3.3 ICES-003 (Canada)

Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le Ministre Canadian des Communications.

(English translation of the notice above) This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department of Communications.

8.3.4 Europe (CE Declaration of Conformity)

This product has been tested in accordance too, and complies with the Low Voltage Directive (73/23/EEC) and EMC Directive (89/336/EEC). The product has been marked with the CE Mark to illustrate its compliance.

8.3.5 Japan EMC Compatibility

Electromagnetic Compatibility Notices (International)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of the notice above:

This is a Class A product based on the standard of the Voluntary Control Council For Interference (VCCI) from Information Technology Equipment. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

8.3.6 BSMI (Taiwan)

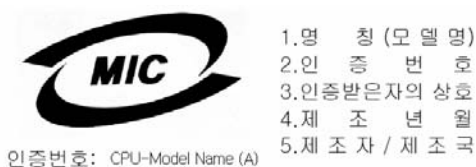
The BSMI Certification number and the following warning is located on the product safety label which is located on the bottom side (pedestal orientation) or side (rack mount configuration).

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

8.3.7 RRL (Korea)

Following is the RRL certification information for Korea.

**English translation of the notice above:**

1. Type of Equipment (Model Name): On License and Product
2. Certification No.: On RRL certificate. Obtain certificate from local Intel representative
3. Name of Certification Recipient: Intel Corporation
4. Date of Manufacturer: See date code on product
5. Manufacturer/Nation: Intel Corporation/See country of origin marked on product

8.3.8 CNCA (CCC-China)

The CCC Certification Marking and EMC warning is located on the outside rear area of the product.

声明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取可行的措施。

8.4 Replacing the CMOS Battery

The lithium battery on the server board powers the real time clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.



WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.



ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.



ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.



WARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.



VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

8.5 Serviceability and Availability

The system is designed to be serviced by qualified technical personnel only.

The desired Mean Time To Repair (MTTR) of the system is 30 minutes including diagnosis of the system problem. To meet this goal, the system enclosure and hardware have been designed to minimize the MTTR.

Following are the maximum times that a trained field service technician should take to perform the listed system maintenance procedures, after diagnosis of the system and having identified the failed component.

Activity	Time Estimate
Remove cover	Remove: 00:20 Install: 00:25
Remove and replace hard disk drive	Remove: 1:09 Install: 2:57
Remove and replace power supply module	Remove: 00:40 Install: 1:07
Remove and replace system fan	Remove: 1:00 Install: 2:36
Remove and replace control panel module	Remove: 00:35 Install: 00:40
Remove and replace baseboard	Remove: 1:25 Install: 3:25

8.5.1 Product Ecology Requirements

Intel has a system in place to restrict the use of banned substances in accordance with world wide product ecology regulatory requirements. Suppliers Declarations of Conformity to the banned substances must be obtained from all suppliers; and a Material Declaration Data Sheet (MDDS) must be produced to illustrate compliance. Due verification of random materials is required as a screening / audit to verify suppliers declarations.

Requirement	Description	P	R	Y/N/D	Src
Product Ecology	All materials, parts and subassemblies must not contain restricted materials as defined in Intel's Environmental Product Content Specification of Suppliers and Outsourced Manufacturers – http://supplier.intel.com/ehs/environmental.htm	1	1	Y	
Product Ecology	Europe - European Directive 2002/95/EC - Restriction of Hazardous Substances (RoHS) Threshold limits and banned substances are noted below. Quantity limit of 0.1% by mass (1000 PPM) for: Lead, Mercury, Hexavalent Chromium, Polybrominated Biphenyls Diphenyl Ethers (PBB/PBDE) Quantity limit of 0.01% by mass (100 PPM) for Cadmium	1	1	Y	
Product Ecology	China RoHS	1	1	Y	

Product Ecology	WEEE Directive	1	1	Y	
Product Ecology	All plastic parts that weigh >25gm shall be marked with the ISO11469 requirements for recycling. Example >PC/ABS<	1	1	Y	
Product Ecology	EU Packaging Directive	1	1	Y	

8.6 Regulated Specified Components

To maintain the UL listing and compliance to other regulatory certifications and/or declarations, the following regulated components must be used and conditions adhered to. Interchanging or use of other component will void the UL listing and other product certifications and approvals.

Updated product information for configurations can be found on the Intel Server Builder Web site at the following URL: <http://channel.intel.com/go/serverbuilder>. If you do not have access to Intel's Web address, please contact your local Intel representative.

- **Server chassis** (base chassis is provided with power supply and fans)—UL listed.
- **Server board**—you must use an Intel server board—UL recognized.
- **Add-in boards**—must have a printed wiring board flammability rating of minimum UL94V-1. Add-in boards containing external power connectors and/or lithium batteries must be UL recognized or UL listed. Any add-in board containing modem telecommunication circuitry must be UL listed. In addition, the modem must have the appropriate telecommunications, safety, and EMC approvals for the region in which it is sold.
- **Peripheral storage devices**—must be UL recognized or UL listed accessory and TUV or VDE licensed. Maximum power rating of any one device is 19 watts. Total server configuration is not to exceed the maximum loading conditions of the power supply

Appendix A: Integration and Usage Tips

This section provides a list of useful information that is unique to the Intel® Server System SR1520ML and should be kept in mind while integrating and configuring your Intel® Server Board X38ML.

- Processor fans are not needed and are not supported. The system fan modules provide the necessary cooling needed for the system. Using a processor fan in this system may cause Intel® System Management Software to incorrectly monitor the system fans.
- The air duct must be used to maintain system thermals.
- System fans are not hot-swappable.
- Make sure the latest system software is loaded on each board. This includes system BIOS, BMC Firmware, and FRU/SDR Package. The latest system software can be downloaded from <http://support.intel.com/support/motherboards/server/X38ML/>

Glossary

Word / Acronym	Definition
ACA	Australian Communication Authority
ANSI	American National Standards Institute
CMOS	Complementary Metal Oxide Silicon
FP	Front Panel
MTTR	Mean Time to Repair
NC	No Connection
OTP	Over-temperature Protection
OVP	Over-voltage Protection
SE	Single-Ended
USB	Universal Serial Bus
VCCI	Voluntary Control Council for Interference

Reference Documents

- Intel® Server Board X38ML Technical Product Specification
- Intel® X38 Series Chipsets Server Board Family Datasheet
- Intel® Server System SR1520ML AC Power Supply Module Specification
- Intel® Server Board X38ML Tested Hardware and OS List
- Intel® Server Board X38ML / Intel® Server System SR1520ML Spares/Parts List and Configuration Guide