

Intel® Desktop Board D810EMO

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Intel® Desktop Board D810EMO

Intel® Desktop Board D810EMO Product Overview

The Intel® Desktop Board D810EMO has the following features:

Form Factor

- FlexATX (9.0 inches by 7.5 inches)

Processor

- Intel® Pentium® III processor (with integrated 256 KB level two cache)
- Intel® Celeron® processor (with integrated 128 KB level two cache)

Chipset

- The Intel® 810E chipset consisting of:
 - Intel® 82810E DC-133 Graphics and Memory Controller Hub (GMCH)
 - Intel® 82801AA I/O Controller Hub (ICH)
 - Intel® 82802AB Firmware Hub (FWH)

Memory

- One 168-pin dual inline memory module (DIMM) socket
- Support for up to 256 MB of 100 MHz non-ECC, unbuffered synchronous DRAM (SDRAM)
 - 32 MB to 256 MB using 16/64/128 Mbit technology
- Support for serial presence detect (SPD) and non-SPD DIMMs

I/O Control

- SMSC LPC47B102 low pin count (LPC) interface super I/O controller

Audio Subsystem

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- Creative 1373D Sound Blaster* AudioPCI 128V audio solution
- Crystal Semiconductor CS4297 AC '97 stereo audio codec

Peripheral Interfaces

- One serial ports
- Two USB ports
- Two USB routed to a header (for front USB)
- RJ-45 LAN
- Rear audio connector LineOut
- Rear audio connector Mic
- Internal audio header for Audio Out Front

Graphics Subsystem

- Intel 82810E DC-133 Graphics and Memory Controller Hub (integrated in the chipset) with 4 MB of 133 MHz video cache memory

Expansion Capabilities

- One PCI bus connector (slot_5)

BIOS

- Intel/AMI BIOS
- Intel 82802AB Firmware Hub (FWH) 4 Mbit flash memory
- Support for SMBIOS, Advanced Configuration and Power Management Interface (ACPI), Advanced Power Management (APM), and Plug and Play.

Other Features

- Speaker
- Fan 1 (chassis) and fan 2 (processor) connectors with fan tachometer

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- Intel® 82559 Network Adapter
- One standard 40 pin IDE header with master/slave
- One mobile 50 pin IDE header with master/slave

Software drivers and utilities are available from Intel at .

* The Intel Desktop Board D810EMO is known in some documentation and sales collateral as the MO810E. Both names refer to the same product.

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Processor Supported

The Intel® Desktop Board D810EMO supports a single Pentium® III processor or Intel® Celeron® processor. The system bus speed of 66 MHz, 100 MHz, or 133 MHz is automatically selected. The processor connects to the desktop board through the PGA370 socket.

Warning: Processors not specifically listed by type and rated speed may have requirements that are not supported by the desktop board's design. Use of unsupported processors may result in improper operation, damage to the desktop board or processor, or reduced product life.

Processor Family	Processor Speed	System Bus Frequency	Cache Size	BIOS Version
Pentium® III processor	800EB MHz	133 MHz	256 KB	P04 or greater
	750 MHz	100 MHz	256 KB	P04 or greater
	733EB MHz	133 MHz	256 KB	P04 or greater
	700 MHz	100 MHz	256 KB	P04 or greater
	667B MHz	133 MHz	256 KB	P04 or greater
	650 MHz	100 MHz	256 KB	P04 or greater
	600EB MHz	133 MHz	256 KB	P04 or greater
	600E MHz	100 MHz	256 KB	P04 or greater
	550E MHz	100 MHz	256 KB	P04 or greater
	533EB MHz	133 MHz	256 KB	P04 or greater
	500E MHz	100 MHz	256 KB	P04 or greater
Intel® Celeron® processor	533 MHz	66 MHz	128 KB	P04 or greater
	500 MHz	66 MHz	128 KB	P04 or greater
	466 MHz	66 MHz	128 KB	P04 or greater
	433 MHz	66 MHz	128 KB	P04 or greater
	400 MHz	66 MHz	128 KB	P04 or greater
	366 MHz	66 MHz	128 KB	P04 or greater

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Tested Memory

System Memory Combinations

The desktop board has one, dual inline memory module (DIMM) socket. Minimum memory size is 32 MB; maximum memory size is 256 MB. The BIOS automatically detects memory type, size, and speed. Due to the video requirements of the Intel Desktop Board D810EMO, most configurations require at least 64 MB of memory.

The desktop board supports the following memory features:

- 168-pin DIMMs with gold-plated contacts
- 100 MHz SDRAM
- Non-ECC (64-bit)
- 3.3 V memory only
- Unbuffered Single- or double-sided DIMMs in the following sizes:

DIMM Size	Non-ECC Configuration
32 MB	4 Mbit x 64
64 MB	8 Mbit x 64
128 MB	16 Mbit x 64
256 MB	32 Mbit x 64

NOTE: 256 MB DIMMs used with this board must be built with 128 Mbit device technology.

CAUTION: Because the main system memory is also used as video memory, the board requires 100 MHz SDRAM DIMMs even if the processor front side bus is 66 MHz. It is highly recommended that SPD DIMMs be used, since this allows the BIOS to read the SPD data and program the chipset to accurately configure memory settings for optimum performance. If non-SPD memory is installed, the BIOS will attempt to correctly configure the memory settings, but performance and reliability may be impacted.

All memory components and DIMMs used with the Intel Desktop Board D810EMO must comply with the PC SDRAM Unbuffered DIMM Specification.

DIMM Vendors

The list below contains vendors that have tested their memory for Intel Desktop Board D810EMO, and have their products listed on their website. Please visit their sites to obtain information on their products.

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- Admor Memory †
- Kingston Technology Company †
- PNY Technologies †
- Shikatronics Inc. †
- Southland Micro Systems †
- Unigen †

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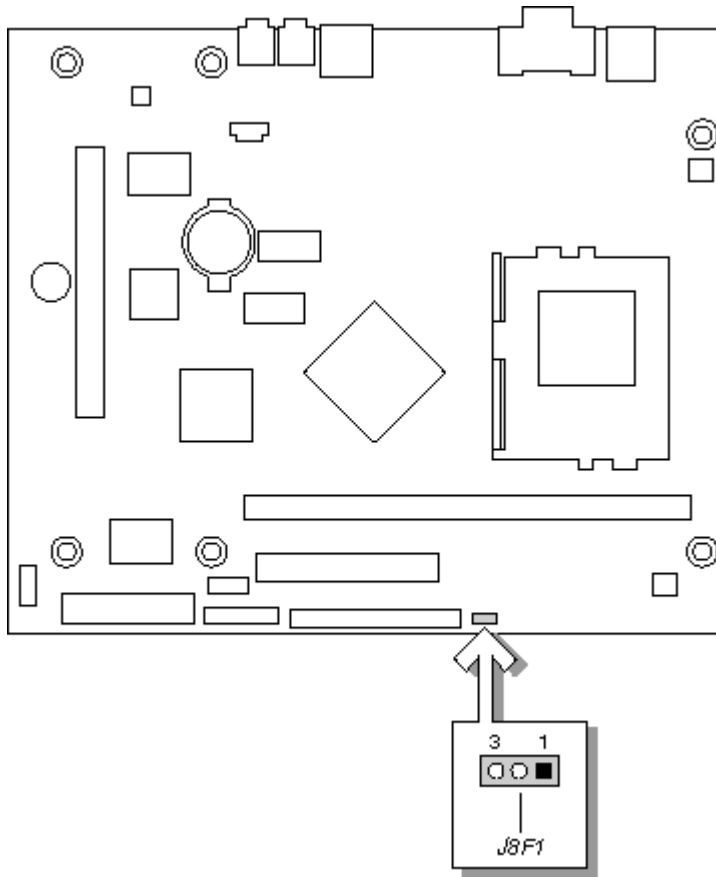
Configuration Jumpers

Jumper Block and Definitions

CAUTION

Do not move jumpers with the power on. Always turn off the power and unplug the power cord from the computer before changing a jumper setting. Otherwise, damage to the board could occur.

The figure below shows the location of the BIOS Setup jumper block. This 3-pin jumper block determines the BIOS Setup program's mode. The table below describes the jumper settings for the three modes: normal, configure, and recovery.



BIOS Setup Configuration Jumper Settings (J8F1)

Function/Mode	Jumper Settings	Configuration
Normal	1-2	The BIOS uses current configuration information and passwords for booting.

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Configure	2-3	After the POST runs, Setup runs automatically. The maintenance menu is displayed.
Recovery	none	The BIOS attempts to recover the BIOS configuration. Bootable recovery media is required.

Connectors

Caution

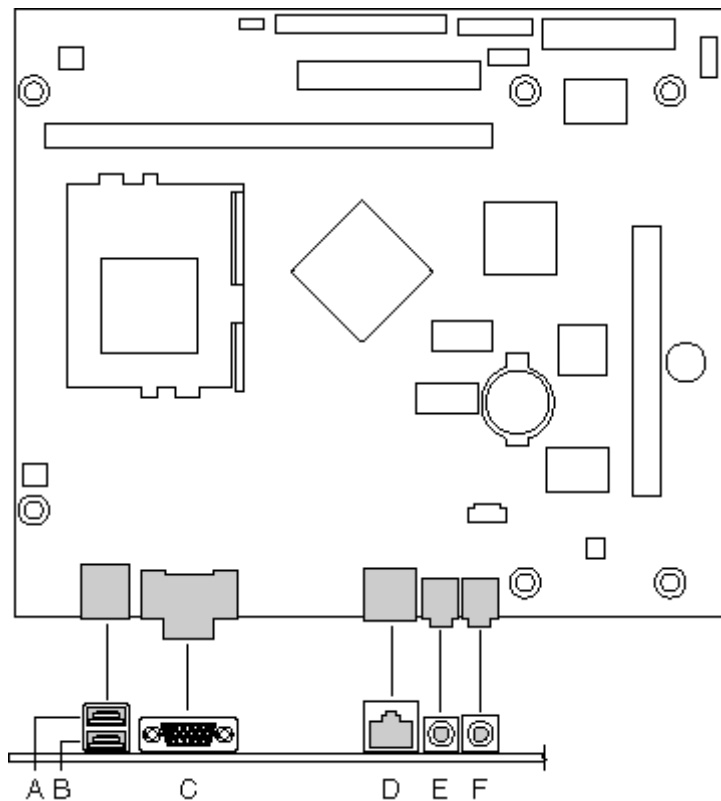
Only the back panel I/O connectors of the board have overcurrent protection. The internal board connectors are not overcurrent protected, and should connect only to devices inside the computer chassis, such as fans and internal peripherals. Do not use these connectors for powering devices external to the computer chassis. A fault in the load presented by the external devices could cause damage to the computer, the interconnecting cable, and the external devices themselves.

This section describes the board's connectors. The connectors can be divided into the following groups:

- Back Panel I/O Connectors
- Internal I/O Connectors
- External I/O Connectors

Back Panel Connectors

The figure below shows the location of the back panel I/O connectors.



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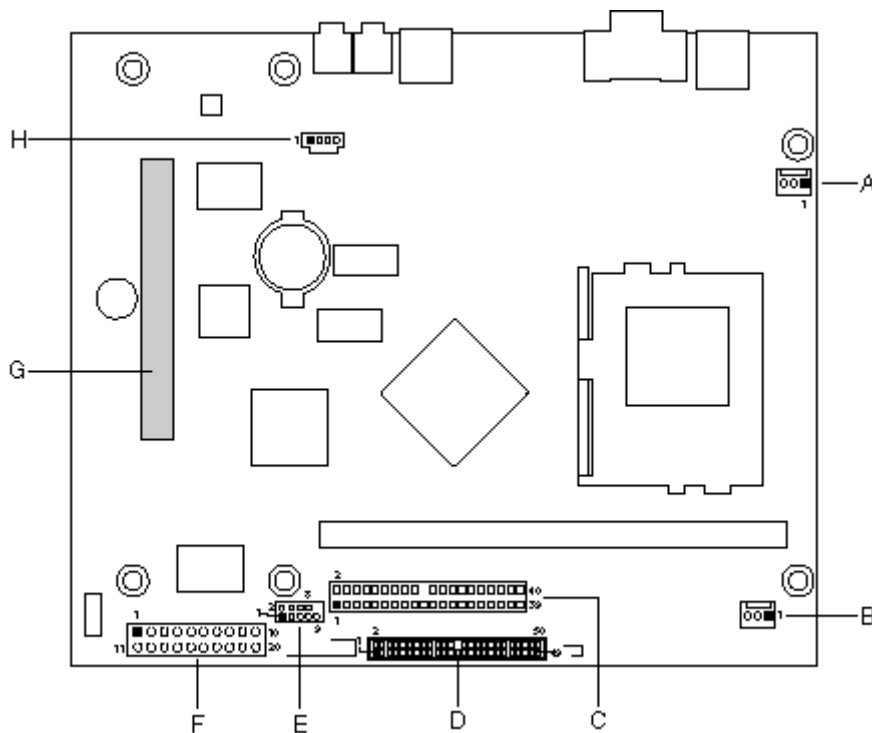
Item	Description
A	USB port 0
B	USB port 1
C	VGA port
D	LAN
E	Audio line out
F	Mic in

Note

The back panel audio line out connector is designed to power headphones or amplified speakers only. Poor audio quality may occur if passive (non-amplified) speakers are connected to this output.

Internal I/O Connectors

The figure below shows the location of the internal I/O connectors.

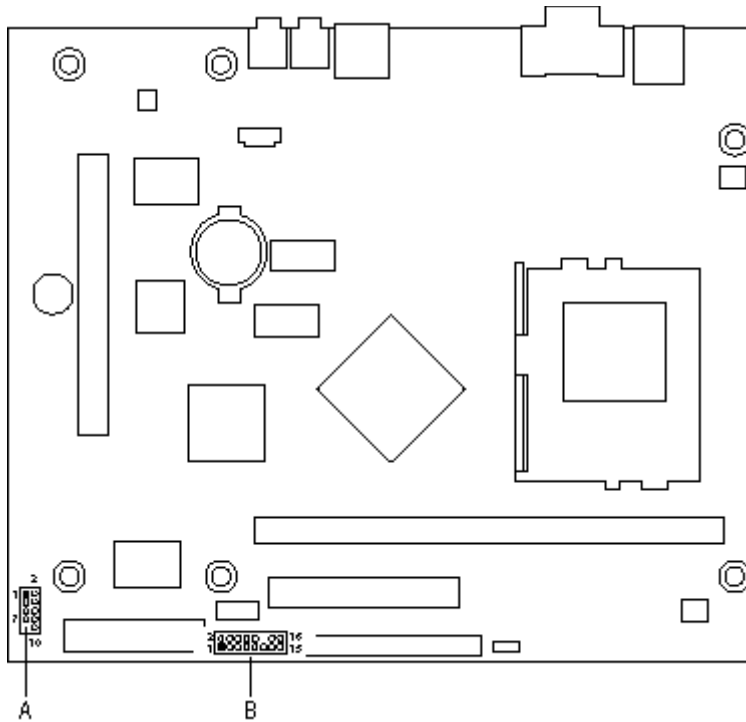


Item	Description	Reference Designator
A	Fan 2 (chassis fan)	J2J1
B	Fan 1 (processor fan)	J7J1
C	Primary IDE	J7E1
D	Slimline IDE	J8E1
E	Serial debug port	J7C1
F	Power	J8B1
G	PCI	J4B1
H	ATAPI	J2D1

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External I/O Connectors

The figure below shows the location of the external I/O connectors.



Item	Description	Reference Designator
A	USB ports	J7A1
B	Front panel	J8C1

The table below lists the signal names of the USB port connector.

USB Port Connector (J7A1)

Pin	Signal Name	Pin	Signal Name
1	USB_PWR	2	USB_PWR
3	USB_P2RL#	4	USB_P3RL#
5	USB_P2RL	6	USB_P3RL
7	Ground	8	Ground
9	Key (no pin)	10	USB_FP_OC

The table below lists the signal names of the front panel connector.

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Front Panel Connector (J8C1)

Pin	Signal	In/Out	Description
Hard Drive Activity LED			
1	HD_PWR	Out	Hard disk LED pull-up (330 Ohms) to +5 V
3	HD_LED#	Out	Hard disk active LED
Power/Sleep/Message Waiting LED			
2	HDR_BLNK_GRN	Out	Front panel green LED
4	HDR_BLNK_YEL	Out	Front panel yellow LED
Reset Switch			
5	GND		Ground
7	FP_RESET#	In	Front panel Reset button
Power Switch			
6	SW_ON#	In	Front panel power switch
8	GND		Ground
Infrared Port			
9	+5 V	Out	IR Power
11	IRRX	In	IrDA* serial input
13	GND		Ground
15	IRTX	Out	IrDA serial output
Miscellaneous			
10	N/C	In	Not connected
12	GND		Ground
14	(Pin removed)		Not connected
16	+5 V	Out	Power

Pins 2 and 4 can be connected to a single- or dual-colored LED. The tables below show the possible states for these LEDs.

States for Single-colored Power LED

LED State	Description	ACPI State
Off	Not running	S1, S3, S5
Steady Green	Running	S0
Blinking Green	Running / message waiting	S0

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States for Dual-colored Power LED

LED State	Description	ACPI State
Off	Power off	S5
Steady Green	Running	S0
Blinking Green	Running / message waiting	S0
Steady Yellow	Sleeping	S1, S3
Blinking Yellow	Sleeping / message waiting	S1, S3

NOTE: To use the message waiting function, ACPI must be enabled in the operating system and a message-capturing application must be invoked.

Pins 6 and 8 can be connected to a front panel power switch. The switch must pull pin 6 to ground for at least 50 ms to signal the power supply to switch on or off. (The time requirement is due to internal debounce circuitry on the board.) At least two seconds must pass before the power supply will recognize another on/off signal.

Pins 1 and 3 can be connected to an LED to provide a visual indicator that data is being read from or written to a hard drive. For the LED to function properly, an IDE drive must be connected to the onboard IDE interface.

Pins 5 and 7 can be connected to a momentary SPST type switch that is normally open. When the switch is closed, the board resets and runs the POST.

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Troubleshootings

Legacy Reduced I/O Connectors and Peripherals

The Intel® Desktop Board D810EMO is a legacy-reduced board with no floppy controller, no PS/2 ports, no parallel port and no ISA slots. The board does have one available PCI slot and two USB ports on the back I/O panel. This means that most peripherals and upgrades will need to be USB with a USB aware operating system.

IDE Cable Installation

The Intel® Desktop Board D810EMO supports Ultra ATA/66 (DMA Mode 4) operation. If you are using an Ultra ATA/66 hard drive, you must use the 40-pin, 80-conductor IDE cable. The IDE cable ships with the Boxed Intel Desktop Board D810EMO. Both the board and the cable are backward compatible with previous transfer protocols.

Install the IDE cable in the following orientation:

1. Plug the blue connector at the end of the cable into the desktop board connector (J7E1).
2. Plug the middle connector into the master drive.
3. Plug the connector at the other end of the cable into the slave drive, if present.

Note: For best performance, place Ultra ATA/66 devices on the primary IDE channel and non-Ultra ATA/66 devices on the secondary IDE channel.

Secondary IDE Cable Information

The boxed Intel® Desktop Board D810EMO comes with a 50-pin slimline IDE to a 40-pin standard IDE adapter cable.

If you are using a standard CD- or DVD-ROM, connect the 50-pin connector into the board at J8E1 and one of the other two connectors into the IDE drive. If you are also installing an IDE LS-120 or ZIP* drive as a slave, you will need to set those device jumpers to the "slave" position, then plug the IDE drive into the remaining connector on the secondary IDE cable.

If your chassis is equipped with a mobile form factor CD- or DVD-ROM, you will need to use a

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50-pin slimline IDE cable to connect the drive to the desktop board. This cable is not included in the boxed Intel® Desktop Board D810EMO. Many slimline IDE cables only come with one drive connector so that any other IDE device would need to be connected to the primary IDE cable as a slave device.

Receive a Beep Code and No Video During Boot

A sequence of short beeps after turning the power on indicates that there was a problem during DRAM memory device detection. Check to ensure system memory is properly installed, and ensure the SDRAM DIMMs you are using are listed on the [test memory list](#).

Processor Heat Sink Fan Will Not Turn

Connect processor heat sink fan power cable to the Fan 1 header (J7J1) on the Intel® Desktop Board D810EMO.

Desktop Board Resources are not Recognized by the Operating System

The Intel® 810E chipset has several components that are new and not included in the retail or OEM versions of Windows* 98 SE. For Windows 98, you will need to install the Intel® 810 IDE-USB Driver Version INFUPDATE 2.10 for Windows 98SE. In this operating system, you will need to install the Intel® Security Driver for the random number generator.

Enabling Ultra ATA/66 Hard Drive Support

To get Ultra ATA/66 disk transfer support, ensure that the following conditions are met:

- Use an Ultra ATA/66 capable hard drive
- Cable the Ultra ATA/66 capable hard drive and cable to the primary IDE connector (J7E1)

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- Follow the instructions in the "Windows* 98 SE Setup" and "Windows* 2000 Setup" instructions to enable DMA transfers in the operating system
- If your hard drive comes with an ultra DMA driver or utility, make sure that you load it and enable Ultra ATA/66 (DMA mode 4) transfers

USB-Aware Operating System

Because of the legacy reduction and power management features of the Intel® Desktop Board D810EMO and Ease of Use PCs in general, only the latest operating systems should be used. Specifically, the Intel Desktop Board D810EMO is designed to support ONLY USB-aware operating systems, Windows* 98 Second Edition or later and Windows* 2000.

Note: USB legacy support must be enabled during the OS installation and when using Windows "Safe Mode."

BIOS Recovery

If you are not experiencing any hardware or software issues, a BIOS update is not recommended. With this new desktop motherboard design, BIOS updates and BIOS recovery procedures are different than in previous Intel® motherboards. Review the BIOS update procedures before attempting a BIOS update or BIOS recovery.

Note: BIOS recovery requires the use of SPD memory.

Selecting ACPI Standby State

The Intel® Desktop Board D810EMO supports two ACPI standby states: S3 and S1

- The S3 state, also known as Suspend to RAM (STR), is an ACPI state that makes PCs Instantly Available. The S3 state provides the greatest amount of power savings and the PC is silent when in this state.
- In the S1 state, a bit more power is consumed and the fans remain on. In general, the S1 state is more stable than the S3 state, because some USB devices are not ACPI compliant and therefore don't work well with STR. The PC will resume operation from either state in a few seconds.

Installing ACPI Support in the Operating System

To load ACPI during Windows* 98 SE installation, type "Setup /p J" (the "J" is case sensitive) on the command line to begin the initial OS installation. Windows* 2000 checks the BIOS creation date to determine whether the board supports ACPI. The Intel® D810EMO Motherboard BIOS is new enough to cause Windows 2000 to enable ACPI power management by default.

Enabling USB Keyboard or USB Mouse as a Wakeup Device

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For the operating system to detect a USB keyboard or a USB mouse (key stroke or mouse click) during system standby mode, they must be enabled in the operating system. To enable keyboard or mouse wakeup:

- Locate the OS Hardware Managers Control Panel.
- Locate and open the Mouse Properties and select the Hardware tab.
- Select the device from the selection box, then the Power Management Tab.
- Check the box labeled " Allow this device to bring the computer out of standby."

You will need to enable both the USB mouse and/or the USB keyboard as described above to bring the system out of standby mode using these devices.

Failure to Power Up

There are several reasons why a desktop board would fail to power up. One reason is that the power supply does not supply sufficient current. The Intel® Desktop Board D810EMO is designed to operate with at least a 145 Watt power supply for typical system configurations. A higher-wattage supply may be required for heavily-loaded configurations. If the power supply does not provide sufficient current and lacks overload protection, the power supply may be damaged. The power supply must provide +5VSB current of 720mA or greater to support Wake On LAN and Suspend to RAM requirements. All Intel Desktop Board D810EMO with an Intel® 82559 LAN chip require this minimum stand-by power.

Another reason the board could fail to power up is the chassis does not contain a momentary switch for the sleep/resume feature. A symptom of this problem is the fan turns on for one second then shuts down and the board will not boot. Powering the system without a momentary switch may cause the desktop board to be stuck in sleep mode. To correct this problem, use the correct type of switch and/or remove the battery for 20 minutes to clear the flip-flop that controls the sleep mode.