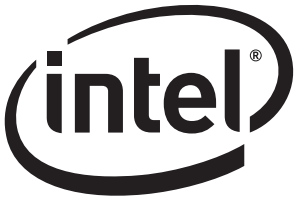


Intel® Desktop Board DP43TF

Specification Update

December 2009

Order Number: E49123-008US

The Intel® Desktop Board DP43TF may contain design defects or errors known as errata, which may cause the product to deviate from published specifications. Current characterized errata are documented in this Specification Update.

Revision History

Revision	Revision History	Date
-001	This document is the first Specification Update for the Intel® Desktop Board DP43TF	July 2008
-002	Update to the General Information section	September 2008
-003	Update to the General Information and Documentation Changes Sections	November 2008
-004	Update to the General Information Section	January 2009
-005	Update to the General Information Section	March 2009
-006	Update to the Specification Changes Section	July 2009
-007	Update to the General Information Section	August 2009
-008	Update to the General Information Section	Decmeber 2009

Contents

Specfication Update for the Intel® Desktop Board DP43TF

This document is an update to the specifications contained in the *Intel® Desktop Board DP43TF Technical Product Specification* (Order Number: E35962). It is intended for hardware system manufacturers and software developers of applications, operating systems, or tools. It will contain Specification Changes, Errata, Specification Clarifications, and Documentation Changes.

For specification updates concerning the Intel processor that apply to this desktop board, refer to the following:

- *Intel® Core™2 Quad Processor Q9000 Series Specification Update* (Order Number: 318727)
- *Intel® Core™2 Quad Desktop Processor Q6600 Specification Update* (Order Number: 315593)
- *Intel® Core™2 Duo Processor E8000 and E7000 Series Specification Update* (Order Number: 318733)
- *Intel® Core™2 Duo Desktop Processor E6000Δ Sequence Specification Update* (Order Number: 313279)
- *Intel® Pentium® Dual-Core Desktop Processor E2000Δ Sequence on 65nm Update* (Order Number: 316982)
- *Intel® Celeron® Processor 400Δ Sequence on 65 nm Process Specification Update* (Order Number: 316964)

Unless otherwise noted in this document, it should be assumed that any processor errata for a given stepping are applicable to the Altered Assembly (AA) revision(s) associated with that stepping.

Refer to the *Intel® 4 Series Express Chipset Family Specification Update* (Order Number 319971) for specification updates concerning the 82P43 MCH Controller and that may apply to the desktop board DP43TF. Unless otherwise noted in this document, it should be assumed that any MCH errata for a given stepping are applicable to the Altered Assembly (AA) revision(s) associated with that stepping.

Refer to the *Intel® I/O Controller Hub10 (ICH10) Family Specification Update* (Order Number 319974) for specification updates concerning the 82801JIB I/O Controller Hub and that may apply to the desktop board DP43TF. Unless otherwise noted in this document, it should be assumed that any ICH10 errata for a given stepping are applicable to the Altered Assembly (AA) revision(s) associated with that stepping.

Terminology

Specification Changes are modifications to the current published specifications. These changes will be incorporated in the next release of the specifications.

Errata are design defects or errors. Characterized errata may cause the desktop board behavior to deviate from published specifications. Hardware and software designed to be used with any given Altered Assembly (AA) and BIOS revision level must assume that all errata documented for that AA and BIOS revision level are present on all desktop boards.

Specification Clarifications describe a specification in greater detail or further highlight a specification's impact to a complex design situation. These clarifications will be incorporated in the next release of the specifications.

Documentation Changes include typos, errors, or omissions from the current published specifications. These changes will be incorporated in the next release of the specifications.

General Information

Basic Desktop Board DP43TF Identification Information

AA Revision	BIOS Revision	Notes
E34878-401	NBG4310H.86A.0051	1,2
E34878-402	NBG4310H.86A.0064	1,2
E34878-403	NBG4310H.86A.0069	1,2
E34878-404	NBG4310H.86A.0096	1,2
E50440-403	NBG4310H.86A.0095	1,2
E50440-404	NBG4310H.86A.0096	1,2

Notes:

1. The AA number is found on a small label on the component side of the board.
2. The 4 Series Chipset kit used on this AA revision consists of two components as follows:

Device	Stepping	S-Spec Numbers
82P43	A2	SLB83
82801JIB	A0	SLB8R

Summary of Changes

The following table indicates the Specification Changes, Errata, Specification Clarifications, or Documentation Changes that apply to the Intel® Desktop Board DP43TF. Intel intends to fix some of the errata in a future revision of the desktop board, and to account for the other outstanding issues through documentation or specification changes as noted.

The following notations are used in the table:

Doc:	Document change or update that will be implemented.
Plan Fix:	This erratum may be fixed in a future revision of the desktop board, driver, or BIOS.
Fixed:	This erratum has been previously fixed.
No Fix:	There are no plans to fix this erratum.
Shaded:	This erratum is either new or modified from the previous version of the document.

No.	Plans	Documentation Changes
1	Doc	Correction of BIOS identifier in revision history and section 3.1 of the Technical Product Specification
2	Doc	Added changes to the *Thermal Considerations for Components* table and added text and a new table, *Tcontrol Values for Components* in Section 2.6 Thermal Considerations.
3	Doc	Added a correction to Item 2 in the Document Changes section of this document. GMCH should be MCH in Figure 15, Table 31, and Table 32.
4	Doc	Support for up to 8 GB system memory has been changed to support for up to 16 GB system memory.
No.	**Plans**	**Errata**
		There are no characterized erratum for this product

Specification Changes

The Specification Changes listed in this section apply to the *Intel® Desktop Board DP43TF Technical Product Specification* (Order Number E35962).

1. Correction of BIOS identifier in Revision History and Section 3.1.

Revision History

Revision	Revision History	Date
-001	First release of the Intel® Desktop Board DP43TF Technical Product Specification	July 2008

This product specification applies to only the standard Intel® Desktop Board DP43TF with BIOS identifier NBG4310H.86A.

Changes to this specification will be published in the Intel Desktop Board DP43TF Specification Update before being incorporated into a revision of this document.

3.1 Introduction

The board uses an Intel BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated using a disk-based program. The SPI Flash contains the BIOS Setup program, POST, the PCI auto-configuration utility, and Plug and Play support.

The BIOS displays a message during POST identifying the type of BIOS and a revision code. The initial production BIOSs are identified as NBG4310H.86A.

2. Changes were made to the Thermal Considerations for Components table, as well as lead-in text and a new table, Tcontrol Values for Components in Section 2.6 Thermal Considerations of the Technical Product Specification.

2.6 Thermal Considerations

⚠ CAUTION

Failure to ensure appropriate airflow may result in reduced performance of both the processor and/or voltage regulator or, in some instances, damage to the board. For a list of chassis that have been tested with Intel desktop boards please refer to the following website:

http://developer.intel.com/design/motherbd/cooling.htm

All responsibility for determining the adequacy of any thermal or system design remains solely with the reader. Intel makes no warranties or representations that merely following the instructions presented in this document will result in a system with adequate thermal performance.

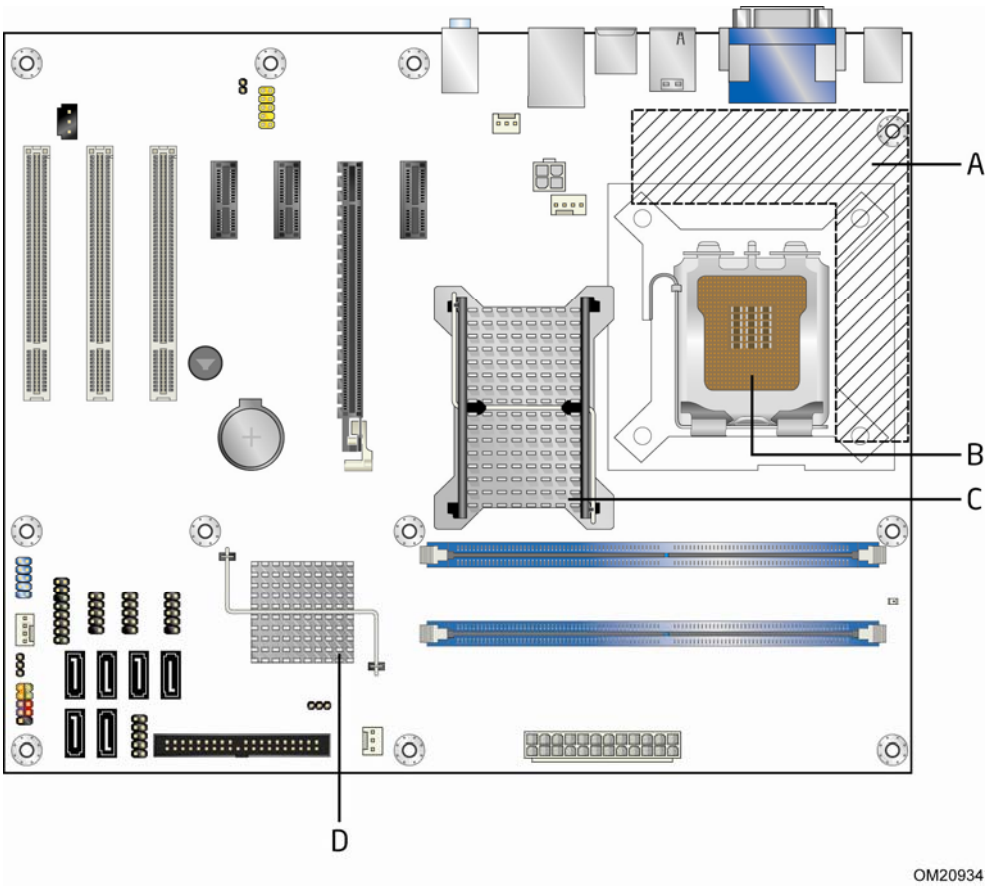
⚠ CAUTION

Ensure that the ambient temperature does not exceed the board's maximum operating temperature. Failure to do so could cause components to exceed their maximum case temperature and malfunction. For information about the maximum operating temperature, see the environmental specifications in Section 2.8.

⚠ CAUTION

Ensure that proper airflow is maintained in the processor voltage regulator circuit. Failure to do so may result in damage to the voltage regulator circuit. The processor voltage regulator area (shown in Figure 15) can reach a temperature of up to 95 °C in an open chassis.

Figure 15 shows the locations of the localized high temperature zones.



Item	Description
A	Processor voltage regulator area
B	Processor
C	Intel 82P43 GMCH
D	Intel 82801JB (ICH10)

Figure 15. Localized High Temperature Zones

Table 31 provides maximum case temperatures for the board components that are sensitive to thermal changes. The operating temperature, current load, or operating frequency could affect case temperatures. Maximum case temperatures are important when considering proper airflow to cool the board.

Table 31. Thermal Considerations for Components

Component	Maximum Case Temperature
Processor	For processor case temperature, see processor datasheets and processor specification updates
Intel 82P43 GMCH	103 °C
Intel 82801JB (ICH10)	111 °C

For information about	Refer to
Processor datasheets and specification updates	Section 1.2, page 15

To ensure functionality and reliability, the component is specified for proper operation when Case Temperature is maintained at or below the maximum temperature listed in Table 31. This is a requirement for sustained power dissipation equal to Thermal Design Power (TDP is specified as the maximum sustainable power to be dissipated by the components). When the component is dissipating less than TDP, the case temperature should be below the Maximum Case Temperature. The surface temperature at the geometric center of the component corresponds to Case Temperature.

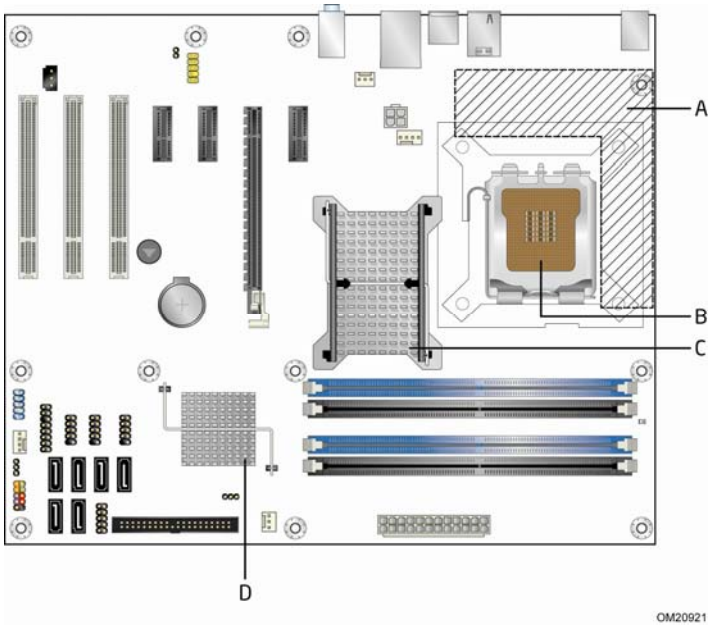
It is important to note that the temperature measurement in the system BIOS is a value reported by embedded thermal sensors in the components and does not directly correspond to the Maximum Case Temperature. Intel® Quiet System Technology (Intel® QST) monitors the embedded thermal sensor for system fan speed control. The upper operating limit when monitoring this thermal sensor is Tcontrol.

Table 32. Tcontrol Values for Components

Component	Tcontrol
Processor	For processor Tcontrol, see processor datasheets and processor specification updates
Intel 82P43 GMCH	99 °C
Intel 82801JB (ICH10)	101 °C

For more information regarding Thermal Design Guidelines please refer to: http://developer.intel.com/Products/Desktop/Chipsets/P43/P43-technicaldocuments.htm

3. The following is a correction to Item 2 (above) in the Document Changes section of this document. GMCH should be MCH in Figure 15, Table 31, and Table 32.



Item	Description
A	Processor voltage regulator area
B	Processor
C	Intel 82P43 MCH
D	Intel 82801JIB (ICH10)

Figure 15. Localized High Temperature Zones

Table 31. Thermal Considerations for Components

Component	Maximum Case Temperature
Processor	For processor case temperature, see processor datasheets and processor specification updates
Intel 82P43 MCH	97 °C (under bias)
Intel 82801JIB (ICH10)	92 °C (under bias)

Table 32. Tcontrol Values for Components

Component	Tcontrol
Processor	For processor Tcontrol, see processor datasheets and processor specification updates
Intel 82P43 MCH	99 °C
Intel 82801JB (ICH10)	101 °C

4. Support for up to 8 GB system memory has been changed to support for up to 16 GB system memory. Partial section of Table 1 shown below.

Table 1. Feature Summary

Form Factor	Micro-ATX (9.60 inches by 9.60 inches [243.84 millimeters by 243.84 millimeters])
Processor	Support for the following: • Intel® Core™2 Quad processor in an LGA775 socket • Intel® Core™2 Duo processor in an LGA775 socket • Intel® Pentium® Dual-Core processor in an LGA775 socket • Intel® Celeron® Dual-Core processor in an LGA775 socket • Intel® Celeron® processor 400 Sequence in an LGA775 socket
Memory	• Four 240-pin DDR2 SDRAM Dual Inline Memory Module (DIMM) sockets • Support for DDR2 800 MHz or DDR2 667 MHz DIMMs • Support for up to 16 GB of system memory using DDR2 800 MHz or DDR2 667 MHz DIMMs

1.5 System Memory

The board has four DIMM sockets and support the following memory features:

- 1.8 V DDR2 SDRAM DIMMs with gold plated contacts, with the option to raise the voltage to support higher performance DDR2 SDRAM DIMMs
- Dual channel interleaved mode support
- Unbuffered, single-sided or double-sided DIMMs with the following restriction:

  Double-sided DIMMs with x16 organization are not supported.
- 16 GB maximum total system memory using DDR2 800 MHz or DDR2 667 MHz DIMMs; refer to Section 2.1.1 on page 45 for information on the total amount of addressable memory.
- Minimum recommended total system memory: 512 MB
- Non-ECC DIMMs
- Serial Presence Detect
- DDR2 800 MHz or DDR2 667 MHz SDRAM DIMMs
- DDR2 667 MHz DIMMs with SPD timings of only 5-5-5 (tCL-tRCD-tRP)
- DDR2 800 MHz DIMMs with SPD timings of only 5-5-5 or 6-6-6 (tCL-tRCD-tRP)

NOTE

To be fully compliant with all applicable DDR SDRAM memory specifications, the board should be populated with DIMMs that support the Serial Presence Detect (SPD) data structure. 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 or the DIMMs may not function under the determined frequency.

Table 3. Supported Memory Configurations

DIMM Type	SDRAM Technology	Smallest usable DIMM (one x16 Single-sided DIMM)	Largest usable DIMM (one x8 Double-sided DIMM)	Maximum capacity with four identical x8 Double-sided DIMMs
DDR2 667	512 Mbit	256 MB	1 GB	4 GB
DDR2 667	1 Gbit	512 MB	2 GB	8 GB
DDR2 667	2 Gbit	1 GB	4 GB	16 GB
DDR2 800	512 Mbit	256 MB	1 GB	4 GB
DDR2 800	1 Gbit	512 MB	2 GB	8 GB
DDR2 800	2 Gbit	1 GB	4 GB	16 GB

2.1.1 Addressable Memory

The board utilizes 16 GB of addressable system memory. Typically the address space that is allocated for PCI Conventional bus add-in cards, PCI Express configuration space, BIOS (SPI Flash), and chipset overhead resides above the top of DRAM (total system memory). On a system that has 16 GB of system memory installed, it is not possible to use all of the installed memory due to system address space being allocated for other system critical functions. These functions include the following:

- BIOS/ SPI Flash (32 Mbits)
- Local APIC (19 MB)
- Direct Media Interface (40 MB)
- Front side bus interrupts (17 MB)
- PCI Express configuration space (256 MB)
- GMCH base address registers, internal graphics ranges, PCI Express ports (up to 512 MB)
- Memory-mapped I/O that is dynamically allocated for PCI Conventional and PCI Express add-in cards
- Base graphics memory support (1 MB or 8 MB)
- Intel® Management Engine Interface (Intel® MEI) single channel (8 MB) or dual channel (16 MB)

The amount of installed memory that can be used will vary based on add-in cards, BIOS settings, and operating system installed. Figure 8 shows a schematic of the system memory map. All installed system memory can be used when there is no overlap of system addresses.

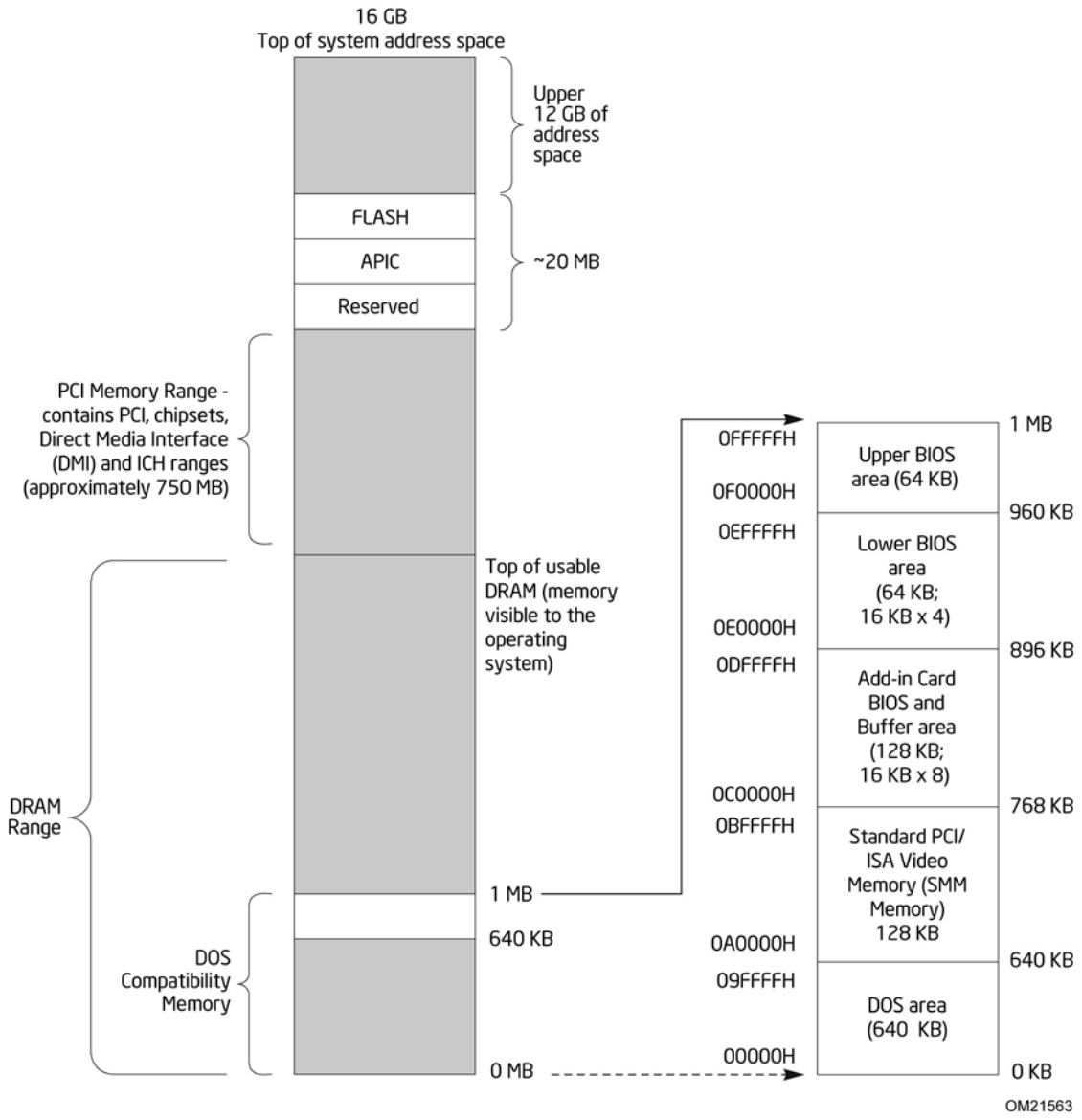


Figure 8. Detailed System Memory Address Map

Table 10 lists the system memory map.

Table 10. System Memory Map

Address Range (decimal)	Address Range (hex)	Size	Description
1024 K - 16777216 K	100000 - 3FFFFFFFF	16382 MB	Extended memory
960 K - 1024 K	F0000 - FFFFF	64 KB	Runtime BIOS
896 K - 960 K	E0000 - EFFFF	64 KB	Reserved
800 K - 896 K	C8000 - DFFFF	96 KB	Potential available high DOS memory (open to the PCI Conventional bus). Dependent on video adapter used.
640 K - 800 K	A0000 - C7FFF	160 KB	Video memory and BIOS
639 K - 640 K	9FC00 - 9FFFF	1 KB	Extended BIOS data (movable by memory manager software)
512 K - 639 K	80000 - 9FBFF	127 KB	Extended conventional memory
0 K - 512 K	00000 - 7FFFF	512 KB	Conventional memory