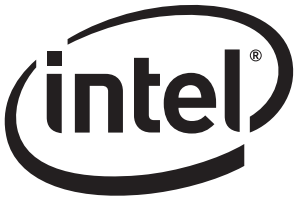

Intel® Desktop Board D946GZIS

Specification Update

December 2007

Order Number D65904-005US

The Intel® Desktop Board D946GZIS 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 D946GZIS.	July 13, 2006
-002	Added Specfication Change 1 and 2, corrected AA revisions in the Gereral Information table, and added additional AA revisions.	September 2006
-003	Added Specification Change 3.	November 2006
-004	Updated General Information table.	February 2007
-005	Updated General Information table	December 2007

Contents

Specfication Update for the Intel® Desktop Board D946GZIS

This document is an update to the specifications contained in the *Intel® Desktop Board D946GZIS Technical Product Specification* (Order Number D56025). 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 may apply to this desktop board, refer to the following:

- Intel® Pentium® 4 Processor 6x1Δ Sequence Specification Update (Order Number 310309)
- Intel® Pentium® 4 Processor on 90 nm Process Specification Update (Order Number 302352)
- Intel® Pentium® 4 Processor Specification Update (Order Number 249199)

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® 946 Express Chipset Family Specification Update* (Order Number 313084) for specification updates concerning the 82946GZ GMCH Controller and that may apply to the desktop board D946GZIS. 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® IO Controller Hub7 (ICH7) Family Specification Update* (Order Number 307014) for specification updates concerning the 82801GB I/O Controller Hub and that may apply to the desktop board D946GZIS. Unless otherwise noted in this document, it should be assumed that any ICH7 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 D946GZIS Identification Information

AA Revision	BIOS Revision	Notes
D45436-305	TS94610J.86A.0025	1,2
D45436-306	TS94610J.86A.0025	1,2
D45436-307	TS94610J.86A.0047	1,2
D45436-401	TS94610J.86A.0047	1,2
D45436-402	TS94610J.86A.0047	1,2
D45436-403	TS94610J.86A.0047	1,2
D45436-500	TS94610J.86A.0047	1,2
D45436-501	TS94610J.86A.0047	1,2
D45436-502	TS94610J.86A.0080	1,2
D45436-503	TS94610J.86A.0087	1,2
D66165-300	TS94610J.86A.0025	1,2
D66165-301	TS94610J.86A.0025	1,2
D66165-302	TS94610J.86A.0047	1,2
D66165-401	TS94610J.86A.0047	1,2
D66165-402	TS94610J.86A.0047	1,2
D66165-501	TS94610J.86A.0047	1,2
D66165-502	TS94610J.86A.0080	1,2
D66165-503	TS94610J.86A.0087	1,2
D83227-401	TS94610J.86A.0047	1,2

AA Revision	BIOS Revision	Notes
D83227-402	TS94610J.86A.0047	1,2
D83227-403	TS94610J.86A.0047	1,2

NOTES:

1. The AA number is found on a small label on the component side of the board.
2. The 946 Chipset kit used on this AA revision consists of two components as follows:

Device	Stepping	S-Spec Numbers
82946GZ	C1	SL9NZ
	C2	SL9R4
82801GB	A1	SL8FX

Summary of Changes

The following table indicates the Specification Changes, Errata, Specification Clarifications, or Documentation Changes that apply to the Intel® Desktop Board D946GZIS. 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	Specification Changes
1	Doc	Change Section 1.1.1 Feature Summary
2	Doc	Change Section 1.4 System Memory
3	Doc	Changes to Section 1.7.2 Audio Connectors
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 D946GZIS Technical Product Specification (Order Number D56025). All Specification Changes will be incorporated into a future version of that specification.

1. Change to Table 1, Section 1.1.1 Feature Summary

   Table 1, Section 1.1.1, Feature Summary will change to remove support for DDR2 800 memory. The revised section of the table will change as follows:

Memory	• Two 240-pin DDR2 SDRAM Dual Inline Memory Module (DIMM) sockets • Support for DDR2 667, or DDR2 533 MHz DIMMs • Support for up to 4 GB of system memory

2. Change to Section 1.4 System Memory

   Section 1.4, System Memory will change to remove support for DDR2 800 memory. The revised section will change as follows:

   1.4 System Memory

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

   - 1.8 V (only) DDR2 SDRAM DIMMs with gold-plated contacts
   - Unbuffered, single-sided or double-sided DIMMs with the following restriction: Double-sided DIMMS with x16 organization are not supported.
   - 4 GB maximum total system memory. Refer to Section 2.1.1 on page 43 for information on the total amount of addressable memory.
   - Minimum total system memory: 128 MB
   - Non-ECC DIMMs
   - Serial Presence Detect
   - DDR2 667, or DDR2 533 MHz SDRAM DIMMs

   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 1 lists the supported DIMM configurations.

Table 1. Supported Memory Configurations

DIMM Type	DRAM Technology	Smallest usable DIMM (one x16 Single-sided DIMM)	Largest usable DIMM (one x8 Double-sided DIMM)	Maximum capacity with two identical x8 Double-sided DIMMs
DDR2 533	256 Mbit	128 MB	512 MB	1 GB
DDR2 533	512 Mbit	256 MB	1 GB	2 GB
DDR2 533	1 Gbit	512 MB	2 GB	4 GB
DDR2 667	256 Mbit	128 MB	512 MB	1 GB
DDR2 667	512 Mbit	256 MB	1 GB	2 GB
DDR2 667	1 Gbit	512 MB	2 GB	4 GB

NOTE

Regardless of the DIMM type used, the memory frequency will either be equal to or less than the processor system bus frequency. For example, if DDR2 667 memory is used with a 533 MHz system bus frequency processor, the memory will operate at 533 MHz. Table 2 lists the resulting operating memory frequencies based on the combination of DIMMs and processors.

Table 2. Memory Operating Frequencies

DIMM Type	Processor system bus frequency	Resulting memory frequency
DDR2 533	533 MHz	533 MHz
DDR2 533	800 MHz	533 MHz
DDR2 533	1066 MHz	533 MHz
DDR2 667	533 MHz	533 MHz
DDR2 667	800 MHz	667 MHz
DDR2 667	1066 MHz	667 MHz

3. The following note will be added to the Technical Product Specification in Section 1.7.2 Audio Connectors:

INTEGRATOR'S NOTES

Electrostatic discharge (ESD) can damage desktop board components. Front-panel connectors should provide sufficient protection to prevent ESD damage to components inside the chassis enclosure.