Purpose of this Utility

The Intel(R) Processor Frequency ID Utility was developed by Intel Corporation to enable customers to discern whether or not an Intel processor is being operated above its Intel rated frequency. It can also be used to identify the Intel processors installed in a system. These features are available by clicking one of the buttons on the left side of the utility display.

The **Frequency Test** section of the utility provides information regarding the operating status of the selected processor.

The **CPUID Data** section of the utility identifies the Intel processor(s) in the system.

The Intel Processor Frequency ID Utility is not intended to identify microprocessors manufactured by companies other than Intel. For additional help on the utility, click the **Help Topics** button in this Help window or click on a topic below:

 How the utility works

 Information reported by the utility

 Multiprocessor or dual processor support

 Multi-language support

 Supported Processors

 Effects of Power Management Features

 Intel(R) SpeedStep(R) technology

 Definitions

 Utility updates

How the Utility works

The **Frequency Test** section of the Intel(R) Processor Frequency ID Utility runs a frequency determination algorithm (speed test) to determine at what internal speed the processor is running. The utility then examines internal data in the processor and makes a comparison between this data and the operating frequency it measured. The utility then informs the user of the overall system status as a result of this comparison.

Note: The Intel(R) Processor Frequency ID Utility only runs this test on systems containing processors that support the Frequency ID functionality. (See the lists of Supported Processors).

The **CPUID Data** section of the utility identifies Intel processors by reading a precise instruction embedded in the processor. The utility translates this instruction and uses it to display information about your processor.

Click the **Save** button to generate a text log file containing all of the information obtained by the Intel Processor Frequency ID utility. This will open a dialog box for choosing the log file name and location. Multiple writes to the same log file (for example, in a multiprocessor system) are appended in that log file.

Information Reported by the Utility

The Intel(R) Processor Frequency ID Utility reports information on the Intel processor being tested. The information reported by the **Frequency Test** section includes the following:

- Processor brand logo
- Processor brand name
- Processor number
- Expected microprocessor operating frequency
- Reported microprocessor operating frequency
- Expected system bus operating frequency
- Reported system bus operating frequency

The above information may be accompanied by a message about the operating frequency status. This message details whether or not the processor is operating at a frequency higher than Intel specifications for the tested processor. In some cases, the frequency test will produce an **Advisory** button. Click this button to view advisory messages about the operating status of the tested processor.

The utility may report a current operating frequency that is slightly higher or lower than the expected frequency for your processor without providing an advisory message. Frequency differences within 1% are due to slight variations in the manufacturing of system components, and are considered to be operating within specifications.

Note: The Intel(R) Processor Frequency ID Utility only reports the above information when run on systems containing processor(s) that support the frequency identification feature. (See the lists of Supported Processors).

The **CPUID Data** section of the utility provides the following information to help identify your Intel microprocessor:

- Processor Brand Name
- Processor Number
- Processor Type
- Processor Family
- Processor Model
- Processor Stepping
- Processor Revision
- Cache Information
- Platform Compatibility Guide information
- Packaging Information
- Processor Features

Use the processor family, model, and stepping to find out additional details on your processor, including processor frequency information for processors not supported by the Frequency Test section of this utility. This information is available from the Intel web site at http://support.intel.com/support/processors/.

Multiprocessor or Dual Processor support

The Frequency Test section of the Intel(R) Processor Frequency ID Utility can determine the frequency of each Intel processor in a multiprocessor system (between 2 and 32 processors). The CPUID Data section of the utility can read and identify each processor. The utility displays the processor that is currently being tested or read in the **Multi-Processor** selection box.

Multiprocessor or dual processor support is only available when using the utility on Microsoft Windows NT*, Windows* 2000, or Windows XP operating systems with multiprocessor support. Multiprocessor features are disabled when using the utility on other operating systems and in single processor systems.

Note: Not all Intel processors support the frequency identification functionality. (See the lists of Supported Processors).

To switch between processors, select the processor you wish to query in the **Multi-Processor** selection box (e.g. select Processor #2 to run the utility on Processor #2).

In a system with Hyper-Threading Technology enabled, the utility will list each physical processor in the Multi-Processor selection box, but it will not list a separate entry for each logical processor. If the system contains only one physical processor, the Multi-Processor selection box will be disabled.

Multi-language Support

The Intel(R) Processor Frequency ID Utility for Windows* is available in the following languages from Intel's support web site at http://support.intel.com/support/processors/tools/frequencyid/freqid.htm:

- English
- French
- Italian
- German
- Brazilian Portuguese
- Spanish
- Russian
- Korean
- Chinese (simplified)
- Chinese (traditional)
- Japanese

*Other names and brands may be claimed as the property of others.

Supported Processors

The Intel(R) Processor Frequency ID Utility for Windows* is a tool provided by Intel Corporation to enable customers and end users to discern whether or not an Intel processor is being operated above its intended operating frequency, as designated by Intel Corporation. The CPUID features of the tool are intended for users to identify the Intel processor(s) in the system.

The **Frequency Test** functionality of the Intel Processor Frequency ID Utility for Windows is designed to operate on computer systems containing an Intel microprocessor found in the following list:

Frequency Test supported processors

- Intel(R) Pentium(R) 4 processor
- Intel Pentium 4 Processor Extreme Edition
- Intel Pentium III processor
- Intel Pentium III processor-S
- Intel Pentium III Xeon(TM) processor
- Intel Xeon processor
- Intel Celeron(R) D processor
- Intel Celeron processor beginning with 533A MHz
- Intel Pentium M processor
- Mobile Intel Pentium 4 processor
- Mobile Intel Pentium 4 processor-M
- Mobile Intel Pentium III processor
- Mobile Intel Pentium III processor-M
- Intel Celeron M processor
- Mobile Intel Celeron processor beginning with 450 MHz

For Intel Celeron processors below 533A MHz and mobile Intel Celeron processors below 450 MHz, find out processor frequency information on the Intel web site at:

Intel Celeron processors: http://support.intel.com/support/processors/sspec/icp.htm

Mobile Intel Celeron processors: http://support.intel.com/support/processors/sspec/micp.htm

The **CPUID Data** feature of the Intel Processor Frequency ID Utility is designed to operate on computer systems containing an Intel processor found in the following list:

CPUID Data supported processors

- Intel(R) Pentium(R) processor
- Intel Pentium processor with MMX(TM) technology
- Intel Pentium OverDrive(R) processor
- Intel Pentium OverDrive processor with MMX technology
- Intel Pentium Pro processor
- Intel Pentium II OverDrive for Pentium Pro processor
- Intel Pentium II processor
- Intel Pentium II Xeon(TM) processor
- Intel Celeron(R) processor
- Intel Celeron D processor
- Intel Pentium III processor
- Intel Pentium III processor-S
- Intel Pentium III Xeon processor
- Intel Pentium 4 processor
- Intel Pentium 4 Processor Extreme Edition
- Intel Xeon processor
- Mobile Intel Pentium processor
- Mobile Intel Pentium II processor
- Mobile Intel Pentium III processor
- Mobile Intel Pentium III processor-M
- Mobile Intel Pentium 4 processor-M
- Mobile Intel Pentium 4 processor
- Intel Pentium M processor
- Mobile Intel Celeron processor

- Intel Celeron M processor

* Other names and brands may be claimed as the property of others.

Intel SpeedStep(R) technology

Intel(R) SpeedStep(R) technology is a feature first implemented in mobile Intel Pentium(R) III processors at 600 MHz and above. Intel SpeedStep technology allows mobile Intel processors to operate in two performance modes: maximum performance mode when the notebook is plugged into an AC power source, and battery-optimized performance mode when the notebook is running on battery power.

See Effects of Power Management Features.

Effects of Power Management Features

Some power management features throttle or reduce the operating frequency of components within the PC. These types of power management features may result in very low tested frequency results. This does not mean that the processor is operating at degraded performance levels. Rather the enabled power management feature is optimizing the efficiency of the processor, either to save power or reduce heat within the system. For instructions on how to disable these power management features, please contact your PC system manufacturer.

See Intel(R) SpeedStep(R) technology.

Definitions

Processor Brand Name

Branded name assigned by Intel Corporation to a specific processor, e.g. Intel(R) Pentium(R) 4 processor.

Processor Number

Intel uses processor numbers to enable consumers to quickly differentiate among comparable processors and to analyze or take into account more than one processor feature during the selection process. Processor numbers should be used to differentiate between the relative overall features *within* a certain processor family (e.g. within the Intel(R) Pentium(R) 4 processor family) and *within* a numbering sequence (e.g. 550 vs. 540). Processor numbers are **not** a measurement of performance. For more information, visit Intel's website at http://www.intel.com.

Family Message

This classification indicates the Intel microprocessor generation and brand. For example, Family 6 (sixth generation) Intel microprocessors include Intel Celeron(R), Pentium(R) II, Pentium II Xeon(TM), Pentium III and Pentium III Xeon processors. Family 5 (fifth generation) includes the Pentium processor and the Pentium processor with MMX(TM) technology. Intel Pentium 4 processors have a Family value of "F" (hexadecimal).

This information can be useful for validating information from the "Quick Reference Guide" that is available for the specific family of your processor.

Type Message

"Type" indicates whether the Intel microprocessor was designed for installation by a consumer (end user) or by a professional PC system integrator, service company, or manufacturer. Type 1 indicates that the microprocessor was intended for installation by a consumer (e.g. upgrade such as an Intel OverDrive(R) processor). Type 0 indicates that the microprocessor was intended for installation by a professional PC system integrator, service company or manufacturer. The processor type depends on whether the processor is a single processor, dual processor, or an Intel OverDrive processor.

Model Message

The "model" number identifies to Intel the microprocessor's manufacturing technology and design generation (e.g. Model 4). Model number is used along with family to determine which specific processor in a family of processors that your computer contains. This information is occasionally needed when communicating with Intel to identify the particular processor.

Stepping Message

The "stepping" number indicates design or manufacturing revision data for production Intel microprocessors (e.g. Stepping 4). Unique stepping numbers indicate versions of processors to facilitate change control and tracking. Stepping also allows an end user to identify more specifically which version of the processor their system contains. This classification data may be needed by Intel when trying to determine the microprocessor's internal design or manufacturing characteristics.

Revision Message

The "revision" number indicates version information for Intel processors within a stepping. The revision information may be useful when communicating with Intel to determine the processor's internal characteristics.

Cache Information

Cache information reported by the CPUID Data section of the utility may include level 2 cache size (if a level 2 cache is present and enabled) as well as level 1 data and instruction cache sizes. Cache is very high-speed memory that stores frequently used instructions and data.

The level 1 cache on Intel(R) Pentium(R) 4 processors consists of a data cache that stores bytes of data, and an Execution Trace Cache that stores decoded instructions. The size of the Execution Trace Cache is given in terms of micro operations (micro-ops or μops).

Intel(R) Xeon(TM) processors designed for multiprocessor use may contain a level 3 cache. Level 3 cache is a larger amount of high-speed storage memory for instructions and data than the level 2 cache, which operates at higher performance than main memory.

On some older mobile systems, the Intel Processor Frequency ID utility is not able to detect the level 2 cache, and will report N/A (not available) for cache information.

Platform Compatibility Guide Information

Platform Compatibility Guide (PCG) encompasses all of the platform power requirements necessary for the proper functionality of the processor as it relates to the motherboard. PCG also provides an easier method of identifying which processor works with which motherboard.

Packaging Information

The Packaging entry on the CPUID Data section of the utility displays the type of physical package that contains the processor.

The possible package types are:

- S.E.C.C./S.E.C.C.2 - the Single Edge Contact Cartridge is a plastic, rectangular enclosure. The cartridge mounts to the system main board via an edge finger connection. There is typically a rectangular fan and/or heatsink assembly mounted to one side of the S.E.C.C./S.E.C.C.2 cartridge.
- S.E.P.P. - the Single Edge Processor Package. It mounts to the system main board via an edge finger connection. There is typically a rectangular fan and/or heatsink assembly mounted to one side of the S.E.P.P. package.
- FC-PGA - the Flip Chip Pin Grid Array package appears as a thin square of green material with an array of gold pins protruding from one side. These pins fit into a socket on the system main board. A square fan and/or heatsink assembly may obscure the top of FC-PGA processors.
- FC-PGA2 - the Flip Chip Pin Grid Array 2 package is a more compact version of the FC-PGA package. It appears as a smaller thin square of green material with shorter and more closely separated gold pins. An integrated heat spreader may obscure the top of FC-PGA2 processors.
- PPGA - the Plastic Pin Grid Array package appears as a thin square of plastic material with an array of gold pins protruding from one side. These pins fit into a socket on the system main board. A fan and/or heatsink assembly mounted on top may obscure PPGA processors.
- MMC2 - a Mobile Module package used only for mobile processors.
- MM - a Mobile Module package used only for mobile processors.
- uPGA/BGA - a Micro Pin Grid Array or Ball Grid Array package used for mobile processors.
- OLGA - an Organic Land Grid Array package used for mobile processors.
- OOI - an OLGA On Interposer package. The interposer translates the fine pitch pads of the OLGA package to a pin field, which connects into the socket on the system main board.
- uFCPGA or uFCPGA2 - a Micro Flip Chip Pin Grid Array package used for mobile processors.
- uFCBGA or uFCBGA2 - a Micro Flip Chip Ball Grid Array package used for mobile processors.
- LGA775 – a Land Grid Array 775 pin package used for desktop processors.

For more information, see the packaging information on Intel's website at:
http://www.intel.com/support/processors/procid/ptype.htm

Multi-Processor

The Multi-Processor selection box in the utility provides a list of the processors in the system (multiple processors will only be visible with Windows NT*, Windows* 2000, or Windows XP operating systems). This field also displays which processor is currently being tested.

Processor Features

The Processor Features area in the CPUID Data section of the utility provides information regarding which Intel processor features and capabilities are present in the tested processor, e.g. Intel MMX(TM) technology, Streaming SIMD Extensions (SSE), Streaming SIMD Extensions 2 (SSE2), Streaming SIMD Extensions 3 (SSE3), Intel NetBurst(TM) microarchitecture, or Hyper-Threading Technology.

Overclock

Operation of a processor above the manufacturer's specified frequency (e.g. operating at 800 MHz with a processor that Intel manufactured to run at 600 MHz).

A processor being operated above its frequency specification (overclocked) may become unstable, or produce unpredictable or erroneous results. These conditions might not be readily apparent and the life of the processor may also be shortened. Intel's warranty does not cover processors that have been overclocked.

System Bus Overclocking

Operation of the system bus above the processor's specified system bus frequency (e.g. operating the system bus at 133 MHz with a processor intended for operation on a 100 MHz system bus). This will typically force the processor to run at a frequency above its intended specification. Refer to the **overclock** definition for more information.

Expected Frequency

This is the frequency at which Intel intended the processor and the system bus to run. This should be the speed physically marked on the processor's packaging.

Reported Frequency

This is the actual operating frequency of the processor and system bus as measured by the Intel Processor Frequency ID Utility. The utility may report a current operating frequency that is slightly higher or lower than the expected frequency for your processor. Frequency differences within 1% are due to slight variations in the manufacturing of system components, and are considered to be operating within specifications.

Utility updates

Click the **Web Update** button to check for updates to the Intel(R) Processor Frequency ID Utility. The utility will open the default web browser to bring up the Frequency ID Download page in the Intel web site. From the Download page, select and download the utility in the desired language.

The Frequency ID Download web site is located at the following URL:
http://support.intel.com/support/processors/tools/frequencyid/freqid.htm