

Microprocessor (CPU) Sockets Handout

CPU Socket – the place on the motherboard where the microprocessor is installed and makes electrical connection with the motherboard.

AMD – Advanced Micro Devices – a major manufacturer of microprocessors (CPU's)

INTEL – A major manufacturer of microprocessors (CPU's)

Pinout – the arrangement of the contact pins (wires) on a CPU

ZIF Socket – Zero Insertion Force – the mechanism that allows a CPU to be installed on a motherboard using no force. Keeps the pins (wires) on the CPU from bending.

Since the very first CPU both Intel and AMD have been creating several different sockets and slots to be used by their processors. In this tutorial we will list all socket and slot types released to date with their respective pinouts, also giving examples of compatible CPUs.

In the beginning, a CPU socket was compatible with just one kind of processor. This story changed with the launching of the 486 processor and the massive use of ZIF (Zero Insertion Force) socket, also known as LIF (Low Insertion Force), which has a lever that installs and removes the CPU from the socket without the need of the user or the technician to press the CPU down in order to be installed on the socket. The use of this socket lowered a lot the chances of breaking or bending the CPU pins during its installation or removal. The use of the same pinout by more than one processor allowed the user or the technician to install different processor models on the same motherboard by just removing the old CPU and installing the new one. Of course the motherboard needed to be compatible with the new CPU being installed and also properly configured.

Since then both Intel and AMD have been developing a series of sockets and slots to be used by their CPUs.

The socket created to be used together with the very first 486 processor wasn't ZIF and didn't allow you to replace the CPU with a different processor model. Even though this socket didn't have an official name, let's call it socket 0. After socket 0 Intel released socket 1, which had the same pinout of socket 0 with the addition of a key pin. It also adopted ZIF standard, allowing the installation of several different processor types on the same socket (i.e. on the same motherboard). Other socket standards were released for the 486 family after socket 1 – socket 2, socket 3 and socket 6 – in order to increase the number of CPU models that could be installed on the CPU socket. Thus socket 2 accepts the same CPUs accepted by socket 1 plus some more models, and so on. Even though socket 6 was designed, it was never used. Thus we usually call the pinout used by 486-class processors as "socket 3". Intel called "overdrive" the possibility of a socket to accept more than one CPU model. Intel also adopted this name on CPUs that used a pinout from an older CPU, in order to allow it to be installed on an older motherboard.

The first Pentium processors (60 MHz and 66 MHz) used a pinout standard called socket 4, which was fed with 5 V. Pentium processors from 75 MHz on were fed with 3.3 V and thus required a new socket, called socket 5, which was incompatible with socket 4 (a Pentium-60 couldn't be installed on socket 5 and a Pentium-100 couldn't be installed on socket 4, for example). Socket 7 uses the same pinout as socket 5 with the addition of one key pin,

accepting the same processors accepted by socket 5 plus new CPUs, especially CPUs designed by competing companies (the real difference between socket 5 and socket 7 is that while socket 5 always fed the CPU with 3.3 V, socket 7 allowed the CPU to be fed with a different voltage level, like 3.5 V or 2.8 V, for example). Super 7 socket is a socket 7 capable of running up to 100 MHz, used by AMD CPUs. We usually call the Pentium Classic and compatible CPUs pinout as "socket 7".

As you may notice, sockets and pinouts at this stage were very confusing, as a given processor could be installed on different socket types. A 486DX-33 could be installed on sockets 0, 1, 2, 3 and, if it were released, 6.

For the next CPUs manufacturers followed a simpler scheme, where each CPU could be installed only on just one socket type.

The table below lists all socket and slot types created by Intel and AMD since the 486 CPU and examples of CPUs compatible with them.

Socket NAME	Pin Count	Example of Compatible CPUs
Socket 0	168	<ul style="list-style-type: none"> • 486 DX
Socket 1	169	<ul style="list-style-type: none"> • 486 DX • 486 DX2 • 486 SX • 486 SX2
Socket 2	238	<ul style="list-style-type: none"> • 486 DX • 486 DX2 • 486 SX • 486 SX2 • Pentium Overdrive
Socket 3	237	<ul style="list-style-type: none"> • 486 DX • 486 DX2 • 486 DX4 • 486 SX • 486 SX2 • Pentium Overdrive • 5x86
Socket 4	273	<ul style="list-style-type: none"> • Pentium-60 and Pentium-66
Socket 5	320	<ul style="list-style-type: none"> • Pentium-75 to Pentium-133
Socket 6	235	<ul style="list-style-type: none"> • 486 DX • 486 DX2 • 486 DX4 • 486 SX

		<ul style="list-style-type: none"> • 486 SX2 • Pentium Overdrive • 5x86
Socket 7	321	<ul style="list-style-type: none"> • Pentium-75 to Pentium-200 • Pentium MMX • K5 • K6 • 6x86 • 6x86MX • MII
Socket Super 7	321	<ul style="list-style-type: none"> • K6-2 • K6-III
Socket 8	387	<ul style="list-style-type: none"> • Pentium Pro
Socket 370	370	<ul style="list-style-type: none"> • Celeron • Pentium III FC-PGA • Cyrix III • C3
Socket 423	423	<ul style="list-style-type: none"> • Pentium 4
Socket 463	463	<ul style="list-style-type: none"> • Nx586
Socket 478	478	<ul style="list-style-type: none"> • Pentium 4 • Celeron • Celeron D • Celeron M • Core Duo • Core Solo • Pentium 4 Extreme Edition • Pentium M • Mobile Pentium III • Mobile Celeron • Mobile Pentium 4
Socket 479 (Socket M)	479	<ul style="list-style-type: none"> • Core Duo • Core Solo • Pentium M • Mobile Pentium III • Mobile Celeron • Mobile • Pentium 4 • Celeron M
Socket 775 (LGA775)	775	<ul style="list-style-type: none"> • Pentium 4 • Pentium 4 Extreme Edition

(Socket T)		<ul style="list-style-type: none"> • Pentium D • Pentium Extreme Edition • Celeron D • Core 2 Duo • Core 2 Extreme
Socket 603	603	<ul style="list-style-type: none"> • Xeon • Mobile Pentium 4
Socket 604	604	<ul style="list-style-type: none"> • Xeon
Socket 771	771	<ul style="list-style-type: none"> • Xeon
Socket 418	418	<ul style="list-style-type: none"> • Itanium
Socket 611	611	<ul style="list-style-type: none"> • Itanium 2
Socket 462 (Socket A)	453	<ul style="list-style-type: none"> • Athlon • Duron • Athlon XP • Sempron
Socket 754	754	<ul style="list-style-type: none"> • Athlon 64 • Sempron • Turion 64
Socket 939	939	<ul style="list-style-type: none"> • Athlon 64 • Athlon 64 FX • Athlon 64 X2 • Opteron
Socket 940	940	<ul style="list-style-type: none"> • Athlon 64 FX • Opteron
Socket AM2	940	<ul style="list-style-type: none"> • Athlon 64 • Athlon 64 FX • Sempron • Athlon 64 X2
Socket AM2+	940	<ul style="list-style-type: none"> • Athlon 64 • Athlon 64 X2 • Opteron • Phenom
Socket S1	638	<ul style="list-style-type: none"> • Turion 64 X2
Socket F	1,207	<ul style="list-style-type: none"> • Opteron • Athlon 64 FX (7x models)

Slot 1	242	<ul style="list-style-type: none">• Pentium II• Pentium III (Cartridge)• Celeron SEPP (Cartridge)
Slot 2	330	<ul style="list-style-type: none">• Pentium II Xeon• Pentium III Xeon
Slot A	242	<ul style="list-style-type: none">• Athlon (Cartridge)