

PRODUCT FACTS

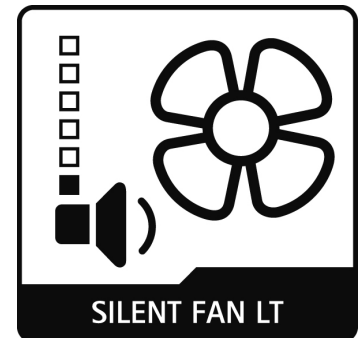
Silent Fan LT

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Product Silent Fan LT

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Brief Description

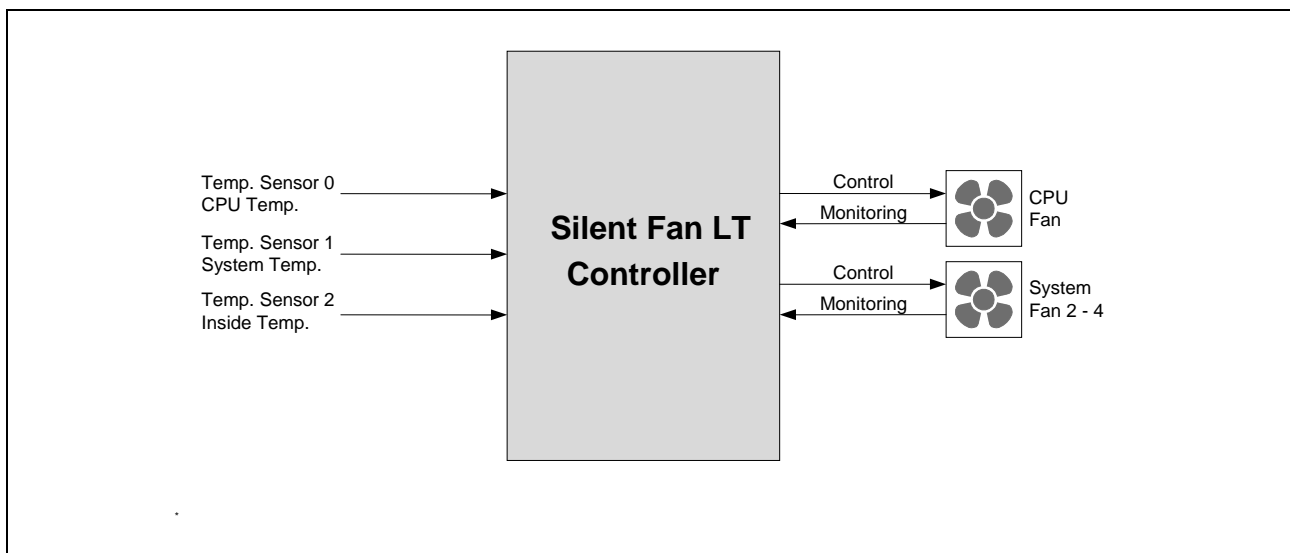
Some versions of Fujitsu Technology Solutions mainboards feature "Silent Fan LT", a fan control and monitoring function; this technology enables customers to build quiet and fault-tolerant PC systems. This functionality is similar to "Silent Fan" found on other Fujitsu Technology Solutions mainboards; however, Silent Fan LT offers less options and operating modes.



Benefits

- Less Noise under most operating conditions
- Higher reliability through optimized cooling and fan monitoring
- Operating system and software independent function; fully functional without drivers that are run under the operating system

Functional Diagram



Functional Description

Some of the Fujitsu Technology Solutions mainboards feature a simplified version of the Silent Fan hardware controller with the capability to control the rotation speed of the fan depending on the CPU temperature. As the Silent Fan LT controller also is autonomous and independent of both processor and operating system, the reliable function is guaranteed even in case of deadlock situations of software or CPU.

Silent Fan Controller

Mainboards with Silent Fan LT include a microcontroller, which constantly records the temperature of the processor, the temperature of key components (such as the Super I/O) and the system temperature. These measurements are used to control and monitor the speed of the fans.

The CPU temperature is measured directly on the processor by means of a built-in diode. Alternatively, the digital PECI interface (Platform Environment Control Interface) is used. These methods are unique and require no sensor on the heat sink or under the processor. The advantage of this type of measurement is higher precision, thus ensuring that the speed of the fans is reduced to a minimum. Thus, the user is provided with a fully optimized silent PC system: As fast as necessary, as quiet as possible.

The temperature diode and the PEC Interface are only available for Intel processors.

The figure above shows the inputs and outputs of the microcontroller that operates totally independent of processor, memory and operating system. This even works in case of processor or system memory malfunction.

In contrast to the Silent Fan Controller on other mainboards, the Silent Fan LT controller doesn't signal any events or alerts. There is also no programming interface available in the Silent Fan LT controller; however, system administration tools such as SystemGuard are supported with limited functionality.

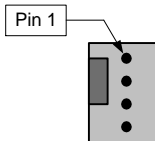
Supported Hardware

4-pin fans

All newer mainboards support fans with four connecting wires. In this case, three of the lines are connected identically as with 3-pin fans (upward compatibility), the fourth pin is used for speed control. Since +12 V is always present at pin 2, 3-pin fans that are connected to this header always rotate at full speed unless the fan has a separate control system. The table below shows the pin assignment.

The speed of a 4-pin fan is controlled via a pulse width modulated (PWM) signal at pin 4. This does not ensure that a fan actually switches off if the Silent Fan LT controller arranges this since the assignment of the speed happens in the fan. In simple terms, the Silent Fan LT Controller specifies the speed in percent by modulating the duty cycle of the control signal. Ideally the fan should rotate at full speed at 100%, at around half speed at 50% and should be stopped at 0%. Unfortunately, this is not the case with each fan type. Please refer to the specification of the selected fan for more details.

Table Fan Control Pin Header for 4-pin fans

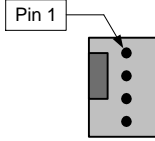
Pin	Signal	Pin Location
1	GND	
2	+12 V	
3	Fan Sense	
4	Fan Control	

3-pin fans

There are also fans with three connecting wires. Two of the lines are used for the supply voltage, while the third pin transmits the actual fan speed (sense pin). The speed control of these fans is performed by changing the supply voltage. Some Fujitsu Technology Solutions mainboards are capable of operating also 3-pin fans on selected connections for 4-pin fans. The function can be selected by the BIOS Setup. In this fan operating mode, the fan connector is attached to pin 1 to 3 of the connector (which is also enforced by the keying of the connector). The table below shows the pin assignment and functionality when a fan header is operated in 3-pin mode.

Some manufacturers offer temperature controlled 3-pin fans that are not externally controlled by the interface but by an internal control logic in the fan itself. This form of control is then based on a separate temperature measurement (mostly in the heat sink of the CPU) and requires a constant 12 V supply voltage. Since the Fujitsu Technology Solutions fan control function (for 3 pin fans) regulates the fan voltage between 6 V and 12 V, there can be problems with such temperature-controlled fans. This might result in an unwanted interference between the two regulation schemes; therefore, this setup is not recommended by Fujitsu Technology Solutions. One exception is the temperature-controlled fan of the Intel Boxed heat sink. Exhaustive tests have revealed that the control function for this fan continues to work even at low voltages.

Table Fan Control Pin Header in operation mode for 3-pin fans

Pin	Signal	Pin Location
1	GND	
2	Controlled Fan Voltage +6 V to +12 V	
3	Fan Sense	
4	Not used	

2-pin fans

Fans with only two leads are not detected by the Silent Fan LT controller (due to the missing speed signal on pin 3) and are therefore not suitable for speed control. If attached to pin 1 and 2, a 2-pin fan is operated with 12 V at full speed.

Additional information and downloads

- General Information:
www.ts.fujitsu.com/mainboards

Documentation and downloads:
<ftp://ts.fujitsu.com/pub/Mainboard-OEM-Sales/>

Contact: Fujitsu Technology Solutions GmbH:
Peter Hoser / Director OEM Sales, Clients Group, Systemboard OEM
Phone: +49 (0) 821 - 804 3177
Fax: +49 (0) 821 - 804 3329
Email: Peter.Hoser@ts.fujitsu.com

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