



F75373S/F75373SG

Fintek Hardware Monitor IC Datasheet

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F75373 Datasheet Revision History

Version	Date	Page	Revision History
0.20P	2003 Apr.		Original version
0.21P	2003 July	9~10	Update fan speed control mechanism description
0.22P	2003 Dec		Add DC spec. in the datasheet
0.23P	2004 July		Revise application circuit
0.24P	2005 July		Add part no. F75373SG(Green package) and delete version ID
0.25P	2007 July		Company readdress

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1 General Description

F75373S is a system hardware monitoring and automatic fan speed controlling IC specific designed for graphic cards etc.. F75373S can monitor several critical hardware parameters of the system, including voltages, temperatures and fan speeds which are very important for the system to work stably and properly.

An 8-bit analog-to-digital converter (ADC) was built inside F75373S. The chip can monitor up to 4 analog voltage inputs, 2 fan tachometer inputs and 2 remote temperature sensors. The remote temperature sensor is suggested to be performed by thermistor. The F75373S can provide automatic fan speed control so that the system can operate at the minimum acoustic noise. Also the users can set up the upper and lower limits (alarm thresholds) of all monitored parameters and this chip can also issue warning messages for system protection when there is something wrong with monitored items.

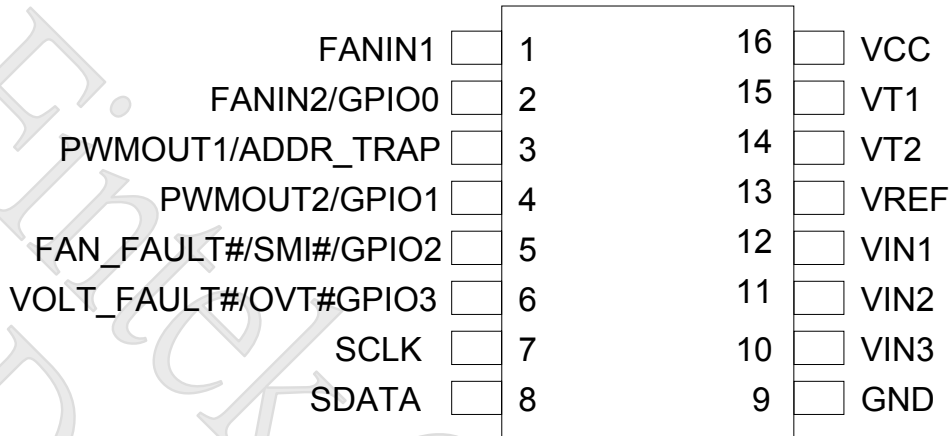
Through the BIOS or application software, the users can read all the monitored parameters of system all the time. And a pop-up warning can be also activated when the monitored item was out of the proper/pre-setting range. The application software could be Fintek's application software MyGuard™, or Intel™ LDCM (LanDesk Client Management), or other management application software. The F75373S is in the package of 150mil 16-pin SOP and powered by 3.3V.

2 Feature

- 4 voltage inputs
 - typical for V_{core} , V_{DDQ} , and V_{CC3V} etc
- Monitor up to 2 remote temperature sensor from remote thermistor
- Up to 2 fan speed monitoring input and 2 automatic fan speed control
 - 3 flexible fan control mode: Manual mode, Speed mode and Temperature mode.
- Programmable limited and setting points(alert threshold) for all monitored items
- Issue FAN_FAULT# or VOLT_FAULT# or OVT# or SMI# signal to activate system protection
- Up to 4 general purpose I/O support
- 2-wire SMBus interface
- V_{CC3V} operation and 16SOP package(150mil)

Noted: Patented TW207103 TW207104 TW220442 US6788131 B1

3 Pin Configuration



4 Pin Description

- O₈ - TTL level output pin with 8 mA source-sink capability
- IN_{ts}/OD₁₂ - TTL level bi-directional pin, can select to O.D or OUT by register, with 12mA source-sink capability
- I/OD₈ - TTL level bi-directional pin, Open-drain output with 8 mA sink capability
- I/OD₁₆ - TTL level bi-directional pin, Open-drain output with 16 mA sink capability
- AOUT - Output pin(Analog)
- OD₁₆ - Open-drain output pin with 16 mA sink capability
- IN_t - TTL level input pin
- IN_{ts} - TTL level input pin and schmitt trigger
- IN_{tsd100k} - TTL level input pin and schmitt trigger with internal pull down 100K ohm
- AIN - Input pin(Analog)
- P - Power

◆ Power Pin

Pin No.	Pin Name	Type	Description
16	VCC	P	3.3V power supply voltage input
9	GND	P	GND

◆ Monitoring Items and Fan Speed Control

Pin No.	Pin Name	Type	Description
1	FANIN1	IN _t	0V to +3.3V amplitude fan tachometer input.
2	GPIO0	IN _{ts} /OD ₈	(Default) General purpose I/O pin. Default Open drain
	FANIN2	IN _t	0V to +3.3V amplitude fan tachometer input.
3	PWMOUT1	O ₁₂	Fan speed control pin.
	ADDR_TRAP	IN _{tsd100k}	Address power on trapping pin. Internal pull down100k ohm
4	GPIO1	IN _{ts} /OD ₁₂	(Default) General purpose I/O pin. Default Open drain
	PWMOUT2	O ₁₂	Fan speed control pin.
10	VIN3	AIN	0V to 2.048V FSR Analog Inputs
11	VIN2	AIN	0V to 2.048V FSR Analog Inputs
12	VIN1	AIN	0V to 2.048V FSR Analog Inputs
14	VT2	AIN	Thermistor 2 terminal input
15	VT1	AIN	Thermistor 1 terminal input.

◆ Alert Signals and Others

Pin No.	Pin Name	Type	Description
5	GPIO2	IN _{ts} /OD ₁₆	(Default) General purpose I/O function. Default pure open drain
	SMI#	OD ₁₆	System management interrupt (Pure Open Drain)
	FAN_FAULT#	OD ₁₆	This pin will be a logic LOW when the fan speed is abnormal.
6	GPIO3	IN _{ts} /OD ₈	(Default) General purpose I/O function. Default Open drain
	OVT#	OD ₈	Active-Low output. This pin will be a logic LOW when the temperature exceeds its limit.
	VOLT_FAULT#	OD ₈	Active-Low output. This pin will be a logic LOW when the voltage exceeds its limit.
13	VREF	AOUT	Reference Voltage. 2.304v

◆ Serial Bus Control Pin

Pin No.	Pin Name	Type	Description
8	SDATA	IN _{ts} /OD ₁₂	Serial Bus data.
7	SCLK	IN _{ts}	Serial Bus clock.

5 Functional Description

F75373S is a system hardware monitoring and automatic fan speed controlling IC specific designed for graphic cards. The chip can monitor up to 4 analog voltage inputs, 2 fan tachometer inputs and 2 remote temperature sensors. The remote temperature sensor is suggested to be performed by thermistor. The F75373S can provide automatic fan speed control so that the system can operate at the minimum acoustic noise. Also the users can set up the upper and lower limits (alarm thresholds) of all monitored parameters and this chip can also issue warning messages for system protection when there is something wrong with monitored items.

5.1 Analog Input

For the 8-bit ADC has the 7.8125mv LSB, the maximum input voltage of the analog pin is 2V. Therefore the voltage under 2V (ex:1.5V) can directly connected to these analog inputs. The voltage higher than 2V should be reduced by a factor with external resistors so as to obtain the input range. Only 3VCC is an exception for it is main power of the F75373S. Therefore 3VCC can directly connect to this chip and need no external resistors. There are two functions in this pin with 3.3V. The first function is to supply internal analog power of the F75373S and the second function is that this voltage with 3.3V is connected to internal serial resistors to monitor the +3.3V voltage. The internal serial resistors are two 50K ohm, so that the internal reduced voltage is half +3.3V.

There are four voltage inputs in the F75373S and the voltage divided formula is shown as follows:

$$V_{IN} = V_{+3.3V} \times \frac{R_2}{R_1 + R_2} \quad \text{where } V_{+3.3V} \text{ is the analog input voltage, for example.}$$

If we choose $R_1=2K$, $R_2=1K$, the exact input voltage for $V_{+3.3V}$ will be 1.1V, which is within the tolerance.

As for application circuit, it can be refer to the figure shown as follows.