EMC6W201

Auto Fan Device with Piecewise Linear Control, Temperature Monitoring & Voltage Monitoring for Multi-Processor Systems

PRODUCT FEATURES

Data Brief

- 3.3 Volt Operation (5 Volt Tolerant Input Buffers)
- SMBus 2.0 Compliant Interface (Fixed, Not Discoverable) With Three Slave Address Options
  - SMBus address change pin
  - SMBus address enable pin
- Auto-Fan Control with ProcHot Features
  - PWM (Pulse width Modulation) Outputs (3)
  - Low Frequency and High Frequency PWM Options (15kHz up to 30kHz)
  - Fan Tachometer or Lock Rotor Inputs (4)
  - Programmable automatic fan control based on temperature
  - Acoustic enhancement mode
  - ProcHot pins modulate Tmin
  - Fan RPM is a function of up to three temperatures and ProcHot signals
  - Piecewise linear fan control algorithm option
- Temperature Monitor
  - Monitoring of up to Five Remote Thermal Diodes (+/- 3 deg C accuracy)
  - Internal Ambient Temperature Measurement
  - Limit Comparison of all Monitored Values
  - Interrupt Pin for out-of-limit Temperature Indication
  - Configurable offset for internal or external temperature channels.
- Voltage Monitor
  - Monitor Power supplies (+1.5V, +2.5V, +5V, VCC and two 1.5V VCCP)
  - Limit Comparison of all Monitored Values
  - Interrupt Pin for out-of-limit Voltage Indication
- ProcHot Input/Bi-directional Pins (2)
  - Selectable pins dedicated as input or input/output
  - Seperate ProcHot Output pin (FORCED_PR#)
- Power Good Output
- SMBus Alert Interrupt Output
- Register Characteristics
  - Individual enables/disables for each input
  - Two ISRs for each alert
- XOR Tree Test Mode
- Mechanical Package: 36-pin QFN, lead-free RoHS Compliant

ORDER NUMBER:

EMC6W201-AEZG FOR 36-PIN QFN LEAD-FREE ROHS COMPLIANT PACKAGE

80 ARKAY DRIVE, HAUPPAUGE, NY 11788 (631) 435-6000, FAX (631) 273-3123

General Description

The EMC6W201 is an environmental monitoring device with automatic fan control capability and enhanced system acoustics for noise suppression. This ACPI compliant device provides hardware monitoring for up to six voltages (including its own VCC) and five external thermal sensors, measures the speed of up to five fans, and controls the speed of multiple DC fans using three Pulse Width Modulator (PWM) outputs. Note that it is possible to control more than three fans by connecting two fans to one PWM output. The EMC6W201 will be available in a 36-pin QFN, lead-free RoHS Compliant package.

The EMC6W201 includes support for monitoring six thermal sensors: five external and one internal. The external temperatures are measured via thermal diode inputs capable of monitoring remote devices. In addition, it is equipped with an ambient temperature sensor for measuring the internal temperature.

The EMC6W201 hardware monitor provides analog inputs for monitoring external voltages of +1.5V, +2.5V, +5V, and two Vccp voltages. This device has the capability to monitor its own internal VCC power supply, which may be connected to either main power (VCC) or the suspend power well (VTR). External components are not required for voltage scaling or similar treatment.

Pulse Width Modulators (PWM) will control the speed of the fans by varying the output duty cycle of the PWM. The Ramp Rate Control feature controls the rate of change of the PWM output, thereby reducing system noise created by changing the fan speed. The speed of each fan is monitored by a Fan Tachometer input. The measured values are compared to values stored in Limit Registers to detect if a fan has stalled or seized.

Fan speed may be under host software control or automatic. In host control mode, the host software continuously monitors temperature and fan speed registers, makes decisions as to desired fan speed and sets each PWM to drive the required fan speed. The PWM frequency is adjustable up to 30kHz. The EMC6W201 device offers an interrupt output signal (INT#), which may be used to interrupt the host on out-of-limit temperature or voltage condition enabling an ACPI response as opposed to the host software continuously monitoring status.

In auto “zone” mode, the EMC6W201 logic continuously monitors the temperature and fan speeds and adjusts speeds without intervention from the host CPU. Fan speed is adjusted according to an algorithm using the temperature measured in the selected zone, the high and low limits set by the user, and the current fan speed. The part can automatically adjust its operation based on its environment for improved acoustic behavior.

Overview

The EMC6W201 device is an intelligent fan control system with reduced overall acoustic noise features. The EMC6W201 monitors voltages, external temperatures, and fan speeds. It uses this monitoring capability to alert the system to out of limit conditions and can automatically control the speeds of multiple fans.

PRODUCT PREVIEW

Pin Configuration

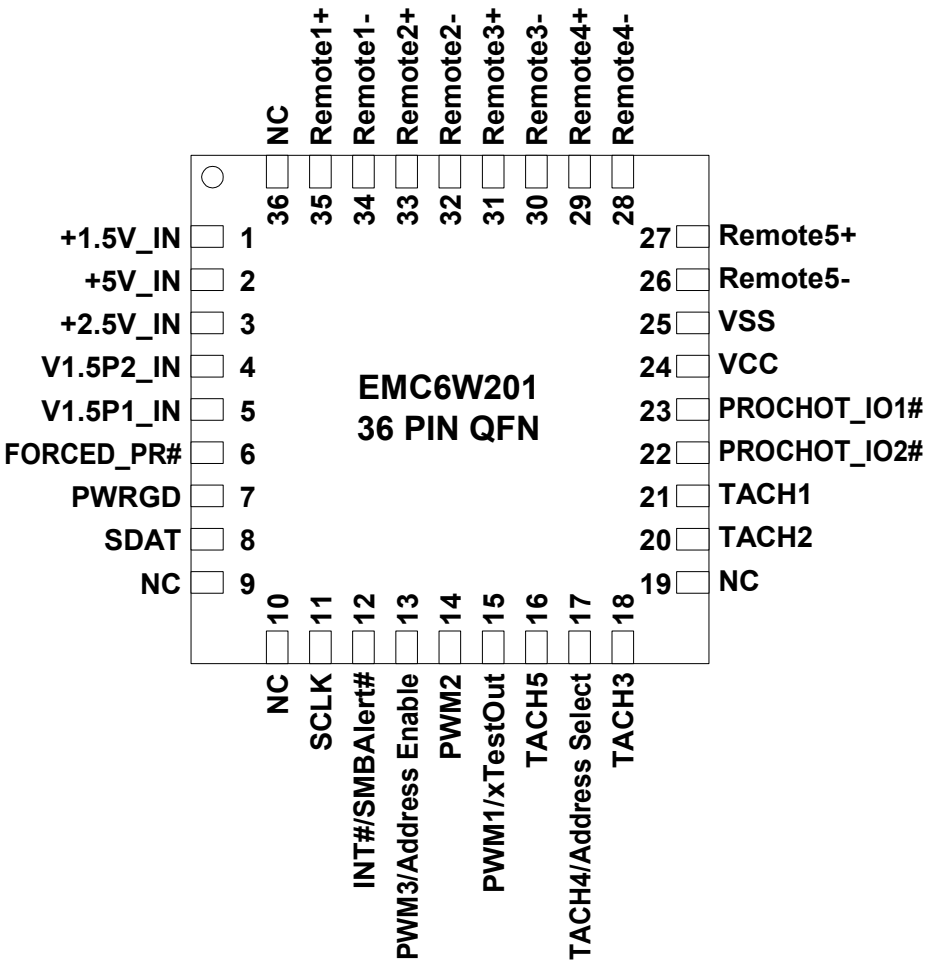
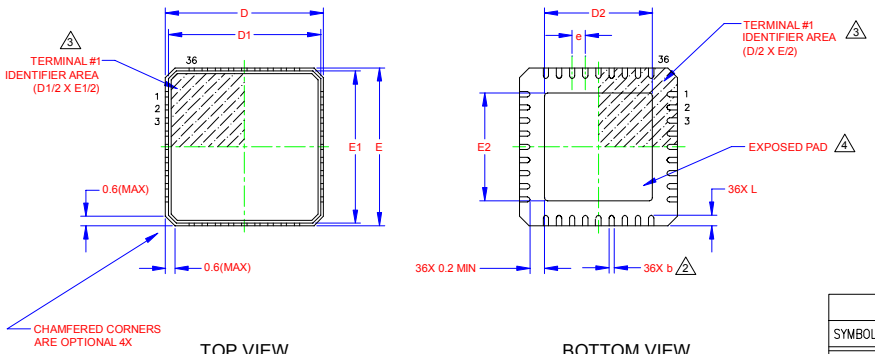
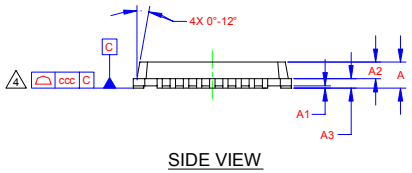


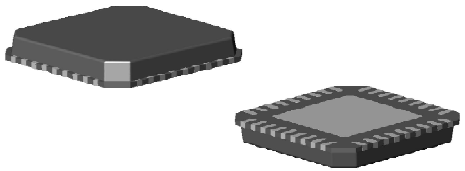
Figure 1 EMC6W201 Pin Configuration

PRODUCT PREVIEW

Package Outline







REVISION HISTORY			
REVISION	DESCRIPTION	DATE	RELEASED BY
-	SEE SPEC FRONT PAGE FOR REVISION HISTORY	-	-

COMMON DIMENSIONS					
SYMBOL	MIN	NOM	MAX	NOTE	REMARK
A	0.80	–	1.00	–	OVERALL PKG HEIGHT
A1	0	0.02	0.05	–	STANDOFF
A2	0.60	–	0.80	–	MOLD THICKNESS
A3		0.20 REF		–	LEAD FRAME THICKNESS
D/E	5.85	6.00	6.15	–	"X"/"Y" BODY SIZE
D1/E1	5.55	–	5.95	–	"X"/"Y" MOLD SIZE
D2/E2		SEE VARIATIONS		–	"X"/"Y" EXPOSED PAD SIZE
L	0.35	–	0.75	–	TERMINAL LENGTH
b	0.18	0.25	0.30	2	TERMINAL WIDTH
e		0.50 BSC		–	TERMINAL PITCH
ccc	–	–	0.08	4	COPLANARITY

D2 / E2 VARIATIONS				
MIN	NOM	MAX	NOTE	CATALOG PART
3.55	3.70	3.85	–	USB3280, USB2502
				EMC6W201
				SIO1036

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETER.
2. POSITION TOLERANCE OF EACH TERMINAL IS ± 0.05mm AT MAXIMUM MATERIAL CONDITION. DIMENSIONS "b" APPLIES TO PLATED TERMINALS AND IT IS MEASURED BETWEEN 0.15 AND 0.30 mm FROM THE TERMINAL TIP.
3. DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE AREA INDICATED.
4. COPLANARITY ZONE APPLIES TO EXPOSED PAD AND TERMINALS.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS AND TOLERANCES ARE:
DECIMAL X.X ±0.1, X.XX ±0.05, X.XXX ±0.025 ANGULAR ±1°
DIM AND TOL PER ASME Y14.5M - 1994
MATERIAL -
FINISH -
PRINT WITH "SCALE TO FIT" DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

	NAME	DATE
DRAWN	S.K.ILIEV	12/6/04
CHECKED	S.K.ILIEV	12/6/04
APPROVED	S.K.ILIEV	12/6/04

80 ARKAY DRIVE
HAUPPAUGE, NY 11788
USA

SMSC
SUCCESS BY DESIGN

TITLE: PACKAGE OUTLINE
36 TERMINAL QFN, 6x6mm BODY, 0.5mm PITCH

DWG NUMBER: MO-36-QFN-6x6 REV: F

SCALE: 1:1 STD COMPLIANCE: JEDEC: MO-220 SHEET: 1 OF 1

Figure 2 EMC6W201 36-Pin QFN Package Outline