

Dual RPM-Based Linear Fan Controller with Hardware Thermal Shutdown

PRODUCT FEATURES

Data Brief

General Description

The EMC2106 is an SMBus compliant fan controller with up to five (up to 4 external and 1 internal) temperature channels. The fan drivers can be operated using two methods each with two modes. The methods include an RPM based Fan Speed Control Algorithm and a direct drive setting. The modes include manually programming the desired settings or using the internal programmable temperature look-up table to select the desired setting based on measured temperature.

The temperature monitors offer 1°C accuracy (for external diodes) with sophisticated features to reduce errors introduced by series resistance and beta variation of substrate thermal diode transistors commonly found in processors.

The EMC2106 also includes a hardware programmable temperature limits and dedicated system shutdown output for thermal protection of critical circuitry.

Applications

- Notebook Computers
- Embedded Applications
- Projectors
- Industrial and Networking Equipment

Features

- Two Programmable Fan Control circuits
 - 4-wire fan compatible
 - High speed PWM (26kHz)
 - Low speed PWM (9.5Hz - 2240Hz)
 - 600mA, 5V, High Side Fan Driver
 - Optional detection of aging fans
 - 1mA Linear DAC Fan Driver
- RPM based fan control algorithm
 - 2% accuracy from 500RPM to 16k RPM
- Temperature Look-Up Table
 - Allows programmed fan response to temperature
 - 1 to 4 thermal zones to control each fan driver
 - Controls fan speed or drive setting
 - Allows externally generated temperature data to control fan drivers including two DTS channels
- Up to Four External Temperature Channels
 - Designed to support 45nm, 60nm, and 90nm CPUs
 - Automatically detects and supports CPUs requiring the BJT or Transistor models
 - Resistance error correction
 - 1°C accurate (60°C to 100°C)
 - 0.125°C resolution
 - Detects fan aging and variation
- Three dedicated comparator outputs for External Diode 1, External Diode 2, and External Diode 3 (OVERT1#, OVERT2#, OVERT3#)
- Up to three thermistor compatible voltage inputs
- Hardware Programmable Thermal Shutdown Temperature
 - Cannot be altered by software
 - 60°C to 122°C Range or 92°C to 154°C Range
- Programmable High and Low Limits for all channels
- 3.3V Supply Voltage
- SMBus 2.0 Compliant
 - 2 selectable SMBus addresses
 - SMBus Alert compatible
 - Option to load register set from external EEPROM
- Available in 28-pin QFN package - Lead Free RoHS compliant (5mm x 5mm)

ORDER NUMBER:

ORDERING NUMBER	PACKAGE	FEATURES
EMC2106-DZK	28 pin QFN (Lead-Free RoHS compliant)	Two independent fan drivers (one High Side, one Linear), up to 4 external diode measurement channels, one Critical / Thermal Shutdown input

REEL SIZE IS 4,000 PIECES

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

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Block Diagram

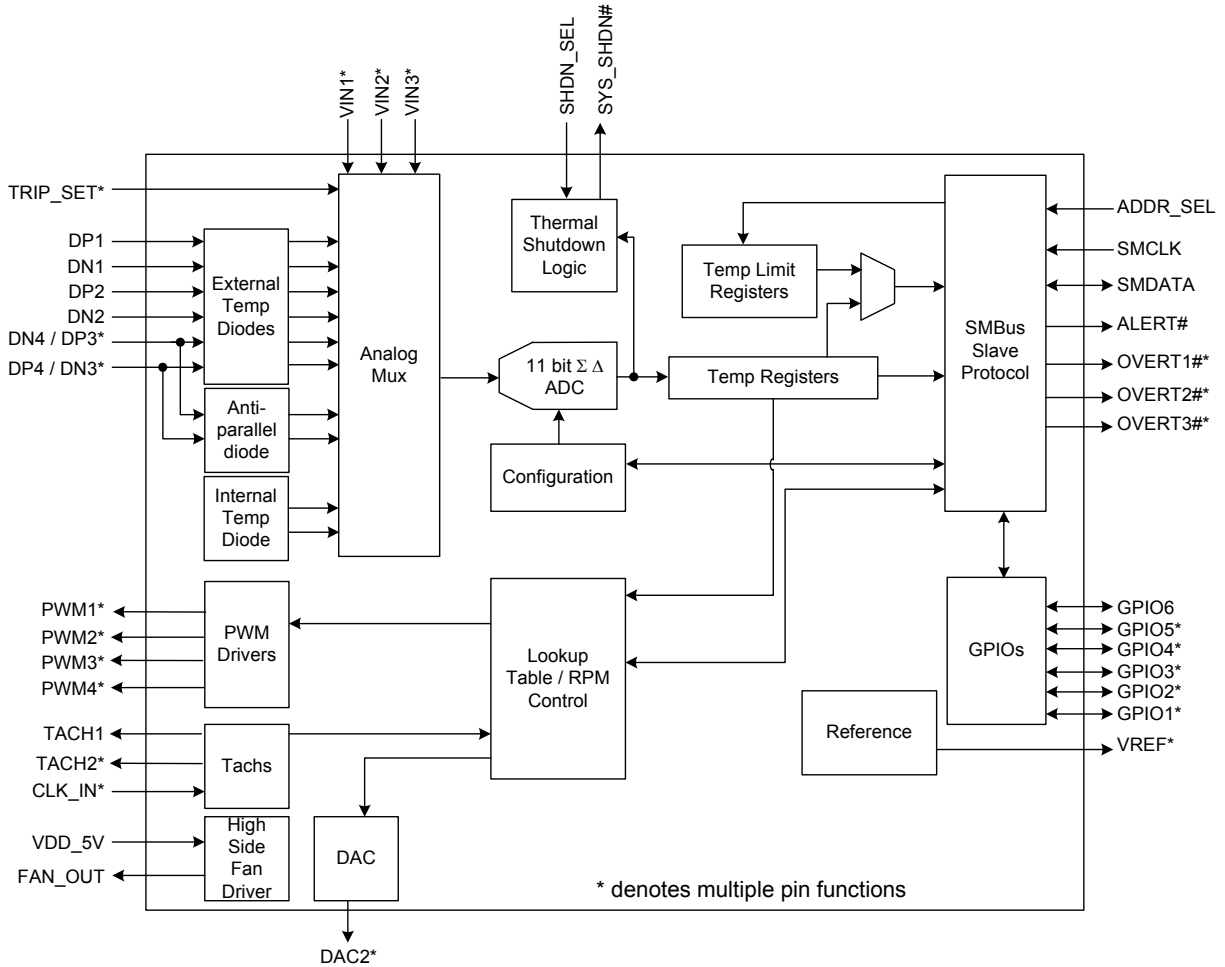
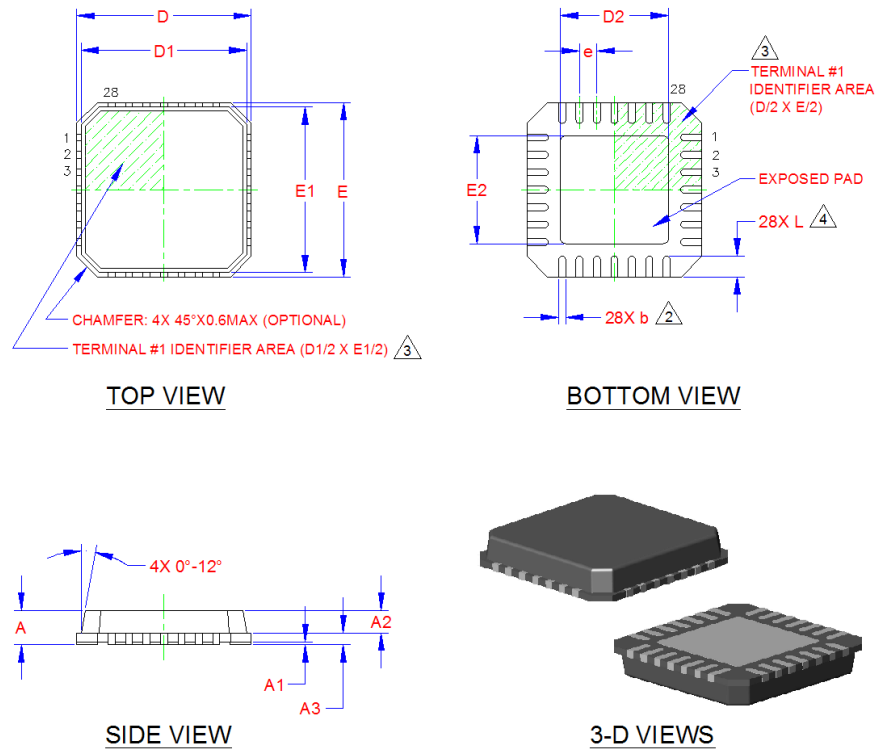


Figure 1 EMC2106 Block Diagram

Package Outline

QFN 28-Pin 5mm x 5mm



COMMON DIMENSIONS					
SYMBOL	MIN	NOM	MAX	NOTE	REMARK
A	0.80	-	1.00	-	OVERALL PACKAGE HEIGHT
A1	0	0.02	0.05	-	STANDOFF
A2	0.60	-	0.80	-	MOLD CAP THICKNESS
A3	0.20		-	-	LEADFRAME THICKNESS
D/E	4.85	5.00	5.15	-	X/Y BODY SIZE
D1/E1	4.55	-	4.95	-	X/Y MOLD CAP SIZE
D2/E2	SEE VARIATIONS		-	2	X/Y EXPOSED PAD SIZE
L	0.50	-	0.75	4	TERMINAL LENGTH
b	0.18	-	0.30	2	TERMINAL WIDTH
e	0.50 BSC		-	-	TERMINAL PITCH

D2/E2 VARIATIONS				
MIN	NOM	MAX	NOTE	CATALOG PART #
2.95	3.10	3.25	2	EMC2102

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETER.
- POSITION TOLERANCE OF EACH TERMINAL AND EXPOSED PAD IS $\pm 0.05\text{mm}$ 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.
- DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE AREA INDICATED.
- ROUNDED INNER TIPS ON TERMINALS ARE OPTIONAL.

Figure 2 EMC2106 28-Pin 5x5mm QFN Package Outline and Parameters