



RPM-Based Linear Fan Controller with Hardware Thermal Shutdown

PRODUCT FEATURES

Data Brief

General Description

The EMC2112 is an SMBus, closed-loop, RPM-based fan driver with hardware (HW) thermal shutdown and reset controller. The EMC2112 offers a single High Side fan driver capable of sourcing up to 600mA from a 5V supply.

The EMC2112 utilizes Beta Compensation (an implementation of the BJT or transistor model for thermal diodes) and Resistance Error Correction (REC) to accurately monitor up to three (3) external temperature zones. These features allow great accuracy for CPU substrate thermal diodes on multiple process geometries as well as with discrete diode-connected transistors. Both Beta Compensation and REC can be disabled on the EMC2112 to maintain accuracy when monitoring AMD thermal diodes.

The EMC2112 provides a stand-alone HW thermal shutdown block. The HW thermal shutdown logic can be configured for a few common configurations based on the strapping level of the SHDN_SEL pin on the PCB. The HW thermal shutdown point can be set in 1°C increments by using a discrete resistor connected to the TRIP_SET pin.

The EMC2112 also provides 5V supply 'power good' function with a threshold of 4.5V. This function is provided on the $\overline{\text{RESET}}$ pin.

Applications

- Notebook Computers
- Desktop Computers
- Embedded Applications

Features

- Closed-Loop RPM Based Fan Controller
 - 1% accuracy with external clock input
 - 3% accuracy with internal clock
 - Internal clock can be used as a source
 - Aging fan detection
- Integrated Linear Fan Driver
 - 600mA Drive Capability
- HW Thermal Shutdown ($\overline{\text{SYS_SHDN}}$)
 - 1°C Incremental Set Points For Thermal Shutdown
 - Cannot be disabled by software
- Provides Reset Function ($\overline{\text{RESET}}$) On 5V Supply
- Up to Three (3) Remote Thermal Zones
 - $\pm 1^\circ\text{C}$ Accuracy (60°C to 100°C)
 - 0.125°C Resolution
 - Designed to support 45nm, 65nm, and 90nm CPU Diodes using BJT and transistor model
 - Eliminates Temperature Offset Due To Series Resistance From PCB Traces And Thermal 'Diode'
- Operates From Single 3.0 - 3.6V Supply
 - 5V Supply For Linear Fan Driver and reset generator
- SMBus 2.0 and I²C compatible
 - User selectable SMBus address using pull-up resistor on ADDR_SEL pin
 - Supports Block Read and Write functionality
- Available in 20-pin, 4x4 QFN Lead-free RoHS Compliant package

ORDER NUMBER(S):

ORDERING NUMBER	PACKAGE	FEATURES
EMC2112-BP-TR	20 pin QFN 4mm x 4mm (Lead-Free RoHS compliant)	Three External Diodes. High Side Fan driver w/ RPM based Fan Speed Control algorithm. Reset generator. Hardware set critical temperature limit

REEL SIZE IS 4,000 PIECES

This product meets the halogen maximum concentration values per IEC61249-2-21
For RoHS compliance and environmental information, please visit www.smSC.com/rohs



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Block Diagram

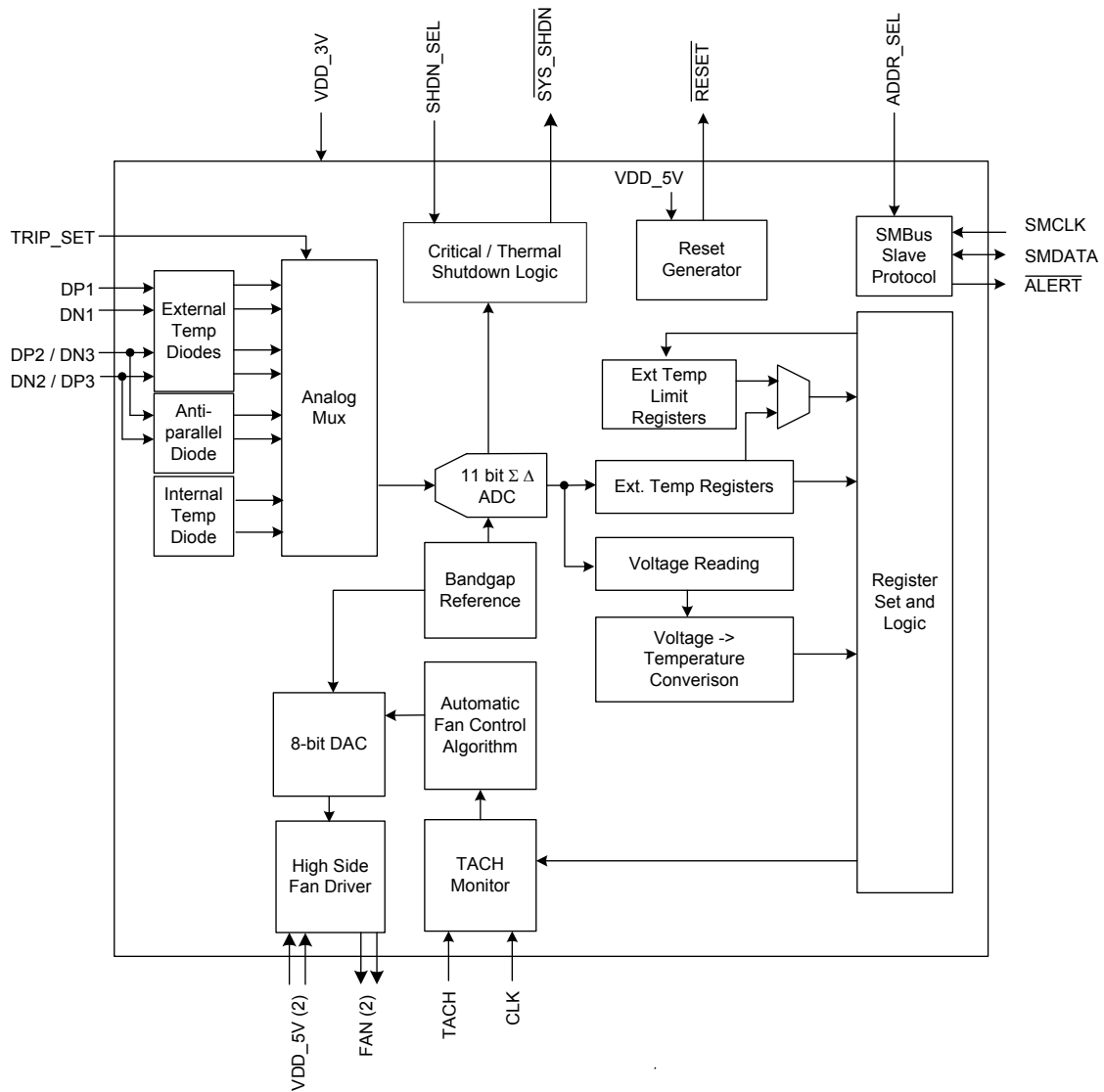


Figure 1 EMC2112 Block Diagram

Package Outline

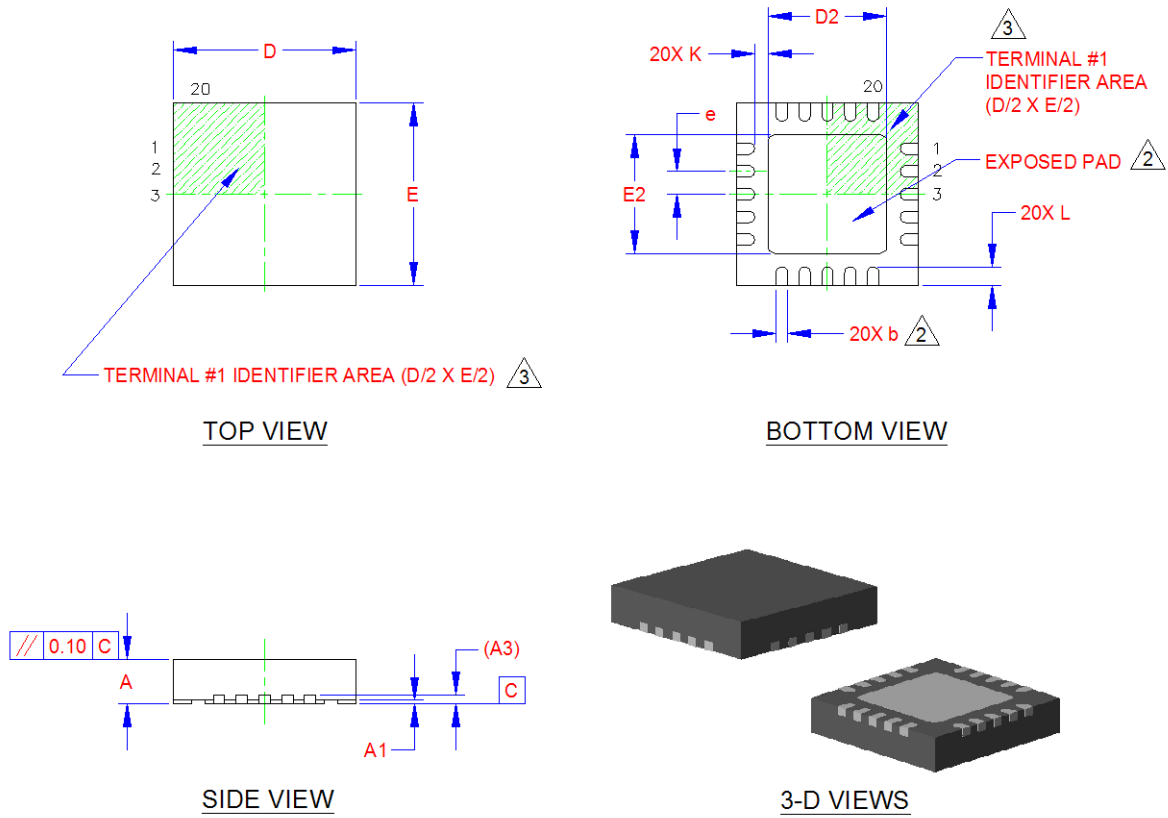


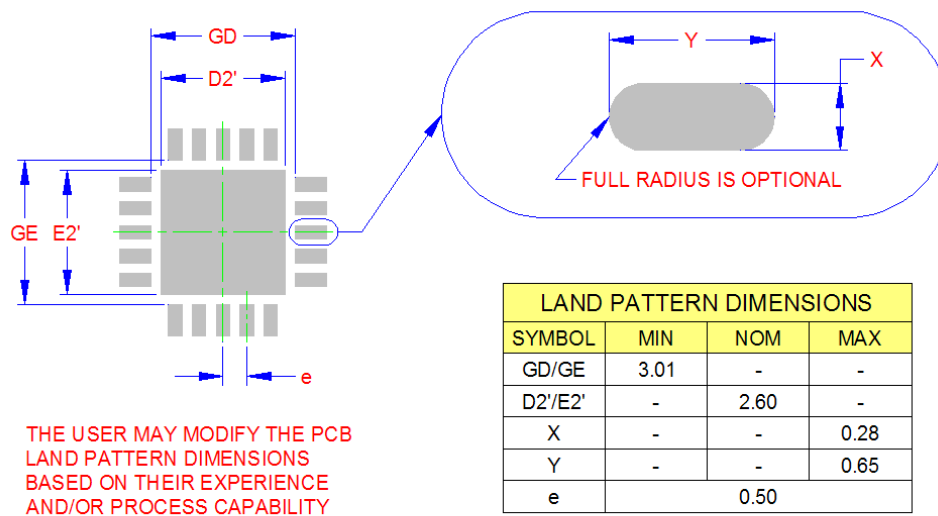
Figure 2 EMC2112 Package Drawing - 20-Pin QFN 4mm x 4mm

COMMON DIMENSIONS					
SYMBOL	MIN	NOM	MAX	NOTE	REMARK
A	0.80	0.85	0.90	-	OVERALL PACKAGE HEIGHT
A1	0	0.02	0.05	-	STANDOFF
A3	0.20 REF			-	LEAD-FRAME THICKNESS
D/E	3.90	4.00	4.10	-	X/Y BODY SIZE
D2/E2	2.50	2.60	2.70	2	X/Y EXPOSED PAD SIZE
L	0.35	0.40	0.45	-	TERMINAL LENGTH
b	0.18	0.25	0.30	2	TERMINAL WIDTH
K	0.20	-	-	-	TERMINAL TO PAD DISTANCE
e	0.50 BSC			-	TERMINAL PITCH

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. 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.
3. DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN THE AREA INDICATED.

Figure 3 EMC2112 Package Dimensions and Notes - 20-Pin QFN 4mm x 4mm



RECOMMENDED PCB LAND PATTERN

Figure 4 EMC2112 PCB Footprint - 20-Pin QFN 4mm x 4mm