STTS424

Memory module temperature sensor

Features

■ Temperature sensor compliant with JEDEC JC42.4

Temperature sensor

■ Temperature sensor resolution: 0.25°C (typ)/LSB

■ Temperature sensor accuracy:
  – ± 1°C from +75°C to +95°C
  – ± 2°C from +40°C to +125°C
  – ± 3°C from –40°C to +125°C

■ ADC conversion time: 125ms (max)

■ Supply voltage: 2.7V to 3.6 V

■ Maximum operating supply current: 200µA

■ Hysteresis selectable set points from: 0, 1.5, 3, 6.0°C

■ Ambient temperature sensing range: -40°C to 125°C
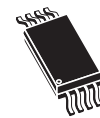
Two-wire bus

■ 2-Wire SMBus/I^{2}C -compatible serial interface

■ Supports up to 100kHz transfer rate

Packages

■ 2mm x 3mm DFN8, height: 0.85mm (typ)

■ 4.4mm x 3mm TSSOP8[a]

■ Halogen-free, lead-free

DFN8 (DA)
2mm x 3mm

TSSOP8 (DW)
4.4mm x 3mm

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a. Contact local ST sales office for availability.

For further information contact your local STMicroelectronics sales office.

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Description

The STTS424 is targeted for DIMM modules in Mobile Personal Computing Platforms (Laptops), Server Memory Modules, and other industrial applications. The thermal sensor (TS) in the STTS424 is fully compliant to the JEDEC 42.4 specification which defines Memory Module Thermal Sensors requirements for Mobile platforms.

The TS provides space as well as cost savings for Mobile and Server Platform Dual Inline Memory Modules (DIMM) manufacturers, as it is packaged in the compact 2mm x 3mm 8-lead DFN package which has a height that will not exceed 0.9mm. It is also available in the JEDEC compliant TSSOP8 package.

The temperature sensor includes a band gap-based temperature sensor and 10-bit Analog-to-Digital Converter (ADC) which monitor and digitize the temperature to a resolution of up to 0.25°C. The typical accuracies over these temperature ranges are:

● ±3°C (max) over the full temperature measurement range of –40°C to 125°C,

● ±2°C in the +40°C to +125°C temperature range, and

● ±1°C in the +75°C to +95°C temperature range.

The temperature sensor in the STTS424 is specified for operating at supply voltages from 2.7V to 3.6V. Operating at 3.3V, the supply current is 100μA (typ).

The on-board sigma delta ADC converts the measured temperature to a digital value that is calibrated in °C. For Fahrenheit applications, a lookup table or conversion routine is required. The STTS424 is factory-calibrated and requires no external components to measure temperature.

The digital temperature sensor component has user-programmable registers that provide the capabilities for DIMM temperature-sensing applications. The open drain Event output pin is active when the monitoring temperature exceeds a programmable limit, or it falls above or below an alarm window. The user has the option to set the Event output as a critical temperature output. This pin can be configured to operate in either a comparator mode for thermostat operation or in interrupt mode.

Figure 1.   Logic diagram
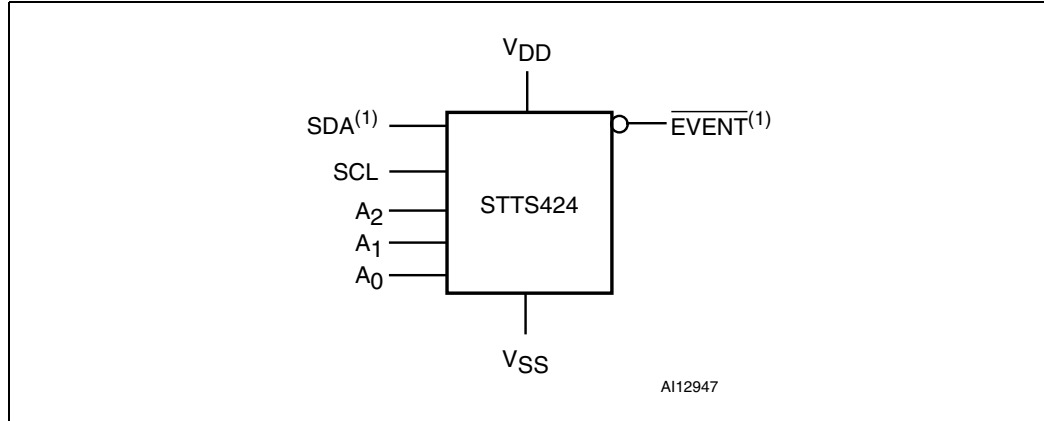
1. SDA and $\overline{\text{EVENT}}$ are open drain.

Table 1.   Signal names

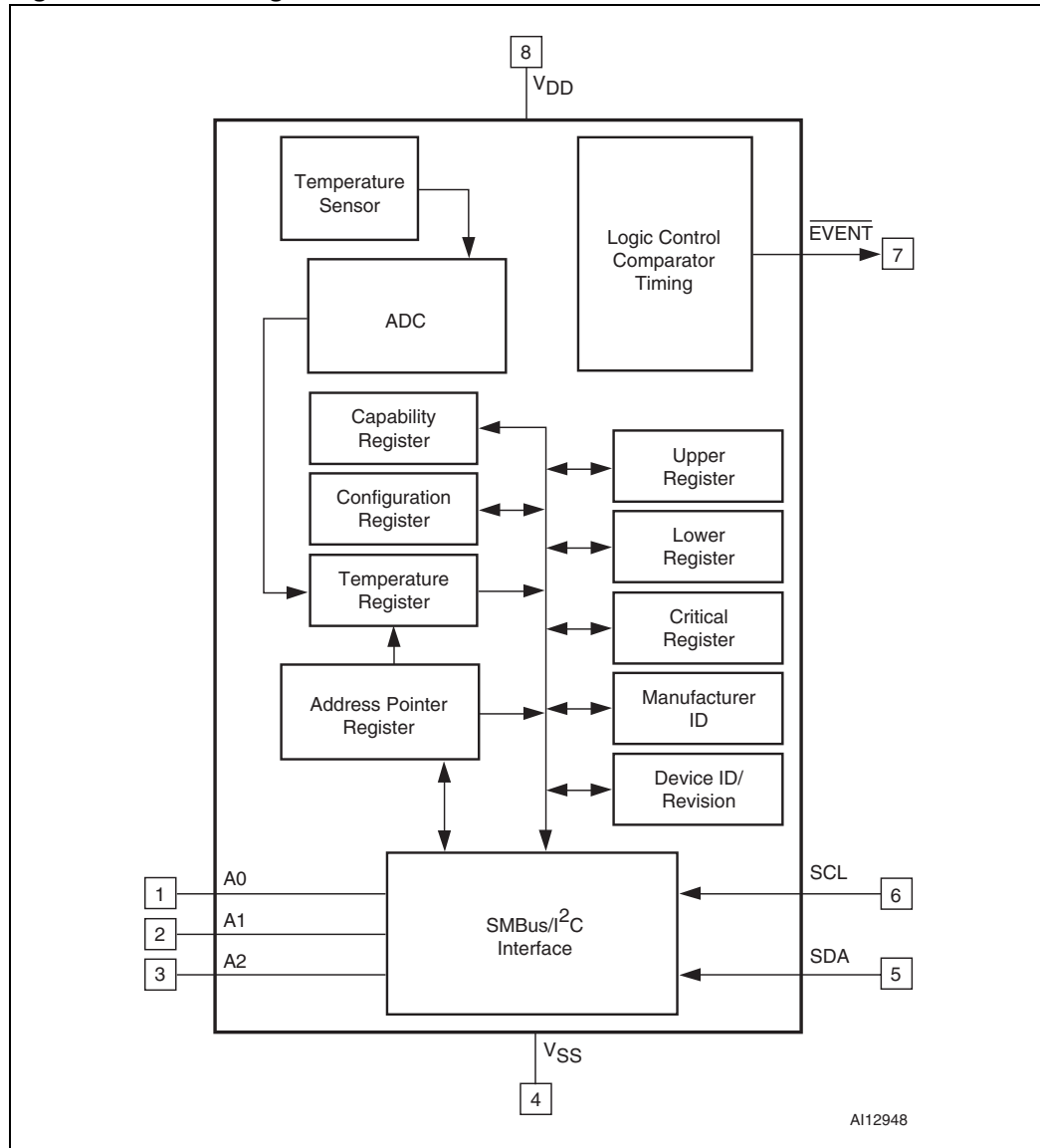| Pin	Symbol	Description	Direction
1	A0	Serial Bus Address selection pin. Can be tied to V_{SS} or V_{DD}.	Input
2	A1	Serial Bus Address selection pin. Can be tied to V_{SS} or V_{DD}.	Input
3	A2	Serial Bus Address selection pin. Can be tied to V_{SS} or V_{DD}.	Input
4	V_{SS}	Supply ground.	
5	SDA[1]	Serial Data.	Input/output
6	SCL	Serial Clock.	Input
7	$\overline{\text{EVENT}}$[1]	Event output pin. Open drain and active-low.	Output
8	V_{DD}	Supply power (2.7V to 3.6V).	

1. SDA and $\overline{\text{EVENT}}$ are open drain.

Figure 2.   Connections (DFN8 and TSSOP8)
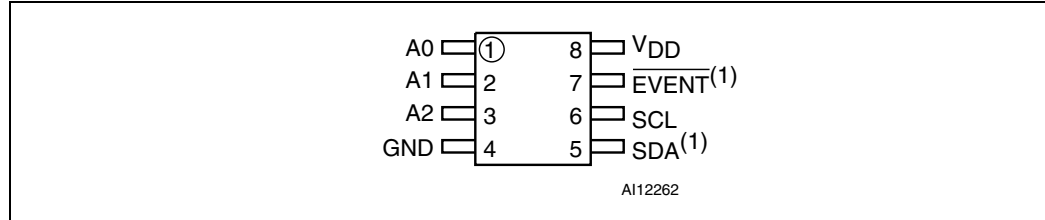
1. SDA and $\overline{\text{EVENT}}$ are open drain.

Figure 3.   Block diagram

Part numbering

Table 2.   Ordering information scheme

Example: STTS424   C   DA   3   F

Device type

STTS424

Grade

C: Maximum accuracy 75°C to 95°C = ± 2°C

B: Maximum accuracy 75°C to 95°C = ± 1°C[1]

Package

DA = DFN8 (2mm x 3mm)

DW = TSSOP8 (4.4mm x 3mm body size)[1]

Temperature range

3 = –40°C to 125°C

Shipping method

F = ECOPACK package, tape & reel packing

E = ECOPACK package, tube packing

1.   Contact local ST sales office for availability

For other options, or for more information on any aspect of this device, please contact the
ST sales office nearest you.

Revision history

Table 3.   Revision history

Date	Revision	Changes
03-Aug-2007	1	Initial release.

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