NIPPON PRECISION CIRCUITS INC.

SM6611 series

Miniature High-Precision Temperature Switch IC

OVERVIEW

The SM6611 series are temperature switch ICs that change state (invert) when the chip temperature exceeds a preset temperature. The switches are designed with temperature hysteresis to prevent unstable output when the temperature is in the vicinity of the preset temperature.

There are 6 output switching temperatures in the series, available in 2 output configurations, making the SM6611 series devices ideal for a wide range of applications.

FEATURES

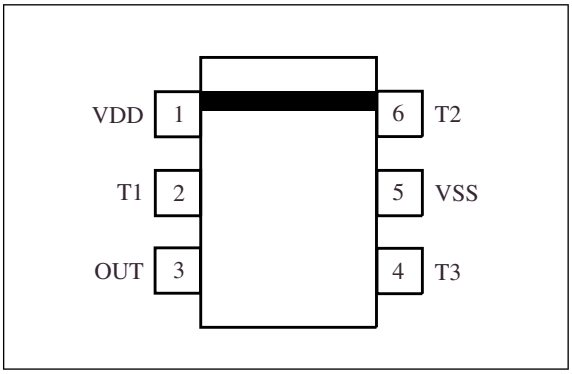
- 2.4 to 10.0V operating supply voltage
- –40 to 100°C operating temperature range
- ±3°C temperature accuracy
- 45 to 95°C output switch temperatures in 10°C steps
- 10°C temperature hysteresis
- 30µA (typ) low current consumption
- Output configuration
  - SM6611×AH open-drain active-LOW output
  - SM6611×BH CMOS active-HIGH output
- 6-pin SOT23-6W package

APPLICATIONS

- Motherboard overheating protection
- Battery-pack temperature protection

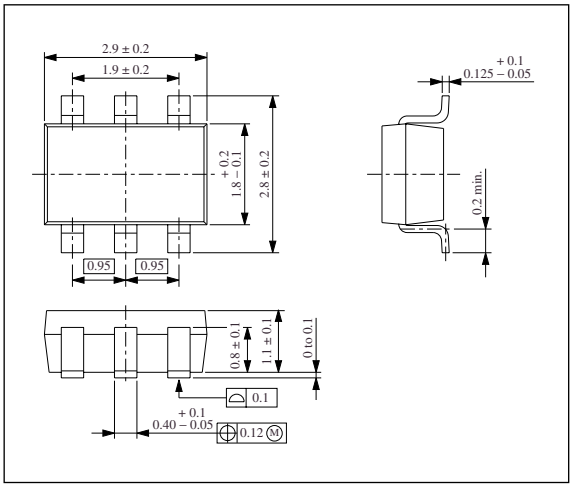
PINOUT

(Top view)



PACKAGE DIMENSIONS

(Unit: mm)



ORDERING INFORMATION

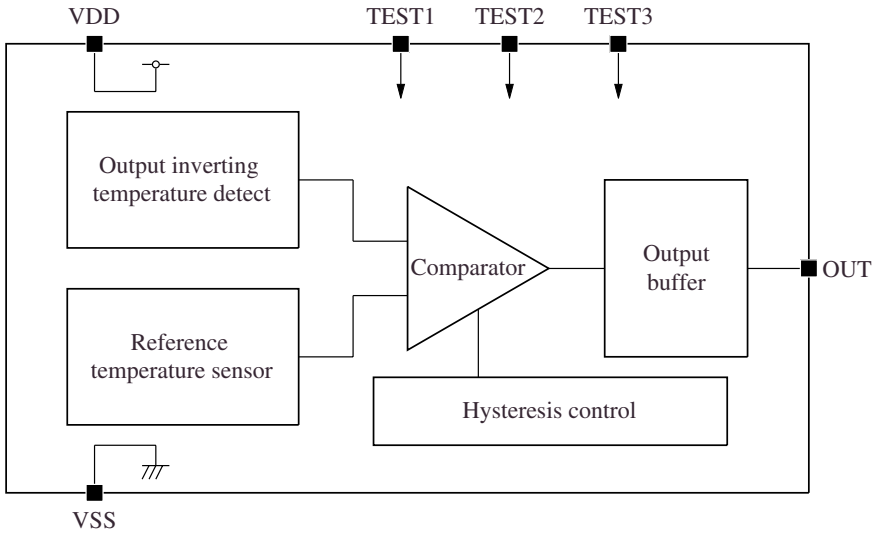
SM6611×AH series

Device	Output switch temperature	Output configuration
SM6611AAH	45°C	Open-drain active-LOW output
SM6611BAH	55°C	
SM6611CAH	65°C	
SM6611DAH	75°C	
SM6611EAH	85°C	
SM6611FAH	95°C	

SM6611×BH series

Device	Output switch temperature	Output configuration
SM6611ABH	45°C	CMOS active-HIGH output
SM6611BBH	55°C	
SM6611CBH	65°C	
SM6611DBH	75°C	
SM6611EBH	85°C	
SM6611FBH	95°C	

BLOCK DIAGRAM



PIN DESCRIPTION

Number	Name	I/O	Description
1	VDD	–	Supply voltage
2	T1	–	Test pin 1. This pin is used for test purposes by NPC. It has a built-in pull-up resistor. Leave open for normal operation.
3	OUT	O	Output. SM6611×AH: Open-drain output. A pull-up resistor of 100kΩ should be connected to this pin. Goes LOW when the switch preset temperature is exceeded. SM6611×BH: CMOS output. Goes LOW to HIGH when the switch preset temperature is exceeded.
4	T3	–	Test pin 3. This pin is used for test purposes by NPC. Connect to VSS for normal operation.
5	VSS	–	Ground
6	T2	–	Test pin 3. This pin is used for test purposes by NPC. Connect to VSS for normal operation.

SPECIFICATIONS

Absolute Maximum Ratings

V_{SS} = 0V

Parameter	Symbol	Rating	Unit
Supply voltage range	V_{DD}	–0.3 to 15	V
Power dissipation	P_D	10	mW
Storage temperature range	T_{STG}	–55 to 125	°C

Recommended Operating Conditions

V_{SS} = 0V

Parameter	Symbol	Rating	Unit
Supply voltage range	V_{DD}	2.4 to 10	V
Operating temperature range	T_{OPR}	–40 to 100	°C

DC Characteristics

V_{DD} = 2.4 to 10V, V_{SS} = 0V, Ta = –40 to 100°C unless otherwise noted

Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Supply voltage	V_{DD}		2.4	–	10	V
Current consumption	I_{DD}		–	30	100	µA
LOW-level output voltage	V_{OL}	I_{SINK} = 1mA, V_{DD} > 2.4V	–	–	0.3	V
		I_{SINK} = 3mA, V_{DD} > 4V	–	–	0.4	V
HIGH-level output voltage	V_{OH}	CMOS output (SM6611×BH), I_{SOURCE} = 0.5mA, V_{DD} > 2.4V	V_{DD} – 1.0	–	–	V
Open-drain output maximum voltage	V_{OMAX}	Open-drain output (SM6611×AH)	–	–	10	V
Open-drain output leakage current	I_{LEAK}	V_{DD} = 2.4V, V_{OUT} = 10V, (SM6611×AH)	–1	–	+1	µA
Output switch temperature accuracy	ΔT_{TH}	45 to 95°C	–3	–	+3	°C
Hysteresis temperature	T_{HYST}		–	10	–	°C

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