

Thermal Management Unit (TMU)

Description

The TM1100 is a fully integrated programmable thermal management unit that is capable of monitoring and maintaining a constant thermal environment of a small enclosure. It incorporates a temperature sensor, temperature controller, 12-bit ADC, and non-volatile memory on a single chip. The TM1100 is controlled via an I²C interface and is housed in a 3mm x 3mm package.

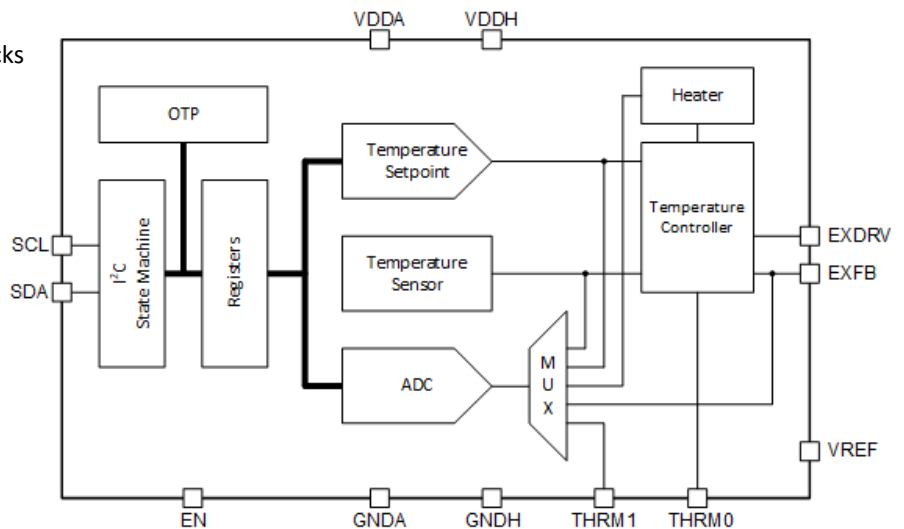
Features

- Temperature management
- Low Allan deviation for high stability clocks
- Programmable and controlled via I²C
- 12-bit 100KSPS ADC
- Temperature sensing accuracy to $\pm 1^{\circ}\text{C}$
- Temperature control accuracy to $\pm 1^{\circ}\text{C}$
- Control of internal or external heater
- Accepts external thermistor elements

Applications

- Thermal Protection/Management
- Environmental Control Systems
- Precision Measurement

Block Diagram



Specifications

Parameter	Conditions	Min	Typ	Max	Unit
Absolute Temperature Sensor Accuracy	$T_A = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$			± 1	$^{\circ}\text{C}$
Temperature Control Accuracy	70°C to $+125^{\circ}\text{C}$			± 1	$^{\circ}\text{C}$
Temperature Set Resolution			0.04		$^{\circ}\text{C}/\text{LSB}$
Heater Element Power			1		W
ADC Resolution		12			Bits
ADC Conversion Time	2MHz Clock (internal)		6		μs
ADC Differential Non-Linearity			± 0.5	± 1	LSB
ADC Integral Non-Linearity			± 2	± 4	LSB
Analog Supply Voltage		3.0	3.3	3.6	V
Analog Supply Current	Internal heater disabled		1.5	10	mA
	Internal heater full power		300		
Operating Temperature Range		-40		125	$^{\circ}\text{C}$

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