

*SENSYLINK Microelectronics*

*(CT1711)*

*S-Wire Digital Temperature Sensor*

***CT1711 is a Low Cost Digital Temperature Sensor with  $\pm 0.1^{\circ}\text{C}$  accuracy over  $30^{\circ}\text{C}$  to  $45^{\circ}\text{C}$  with S-Wire Interface.***

***It is ideally used in Human Body Temperature Measurement.***

# ±0.1 °C Accuracy Digital Temperature Sensor with S-Wire Interface

## Description

CT1711 is a low cost digital temperature sensor with ±0.1°C(Max.) accuracy over 30°C to 45°C. Temperature data can be read out directly via S-Wire interface by MCU.

It includes a high precision band-gap circuit, a 17-bit analog to digital converter that can offer 0.00390625°C resolution, a calibration unit with non-volatile memory and a digital interface block.

The chip is calibrated with ±0.1 °C(Max.) accuracy over 30°C to 45°C range in factory before shipment to customers.

Metal Can package is specially designed to improve heat conduction performance from skin to sensor in human body measurement application.

Available Package: MCLGA3x3-4 package

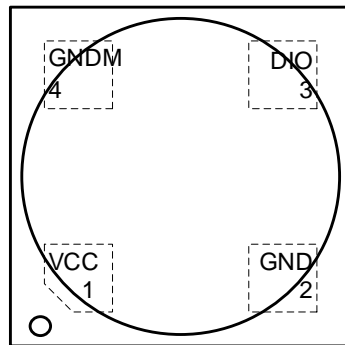
## Features

- Operation Voltage: 1.8V to 5.5V
- Operating Current: 36uA(Typ.) during Temperature Conversion;
- Average Current Consumption: 4.5uA(Typ.) with reading once temperature per second
- Standby Current: 10nA(Typ.), 30nA(Max. <50 °C)
- Temperature Conversion time: 120ms(Typ.)
- Temperature Accuracy: ±0.1°C(Max.) from 30°C to 45°C
- 17 bit ADC with 0.00390625°C resolution
- S-Wire Digital Interface (single-wire lite version)
- Compatible with ISO10993.5/10 (testing)
- Temperature Range: -50°C to 150°C

## Applications

- General Temperature Monitor
- Human Body Temperature Monitor

## PIN Configurations (Top View)



MCLGA3x3-4(package code MC)

## Typical Application

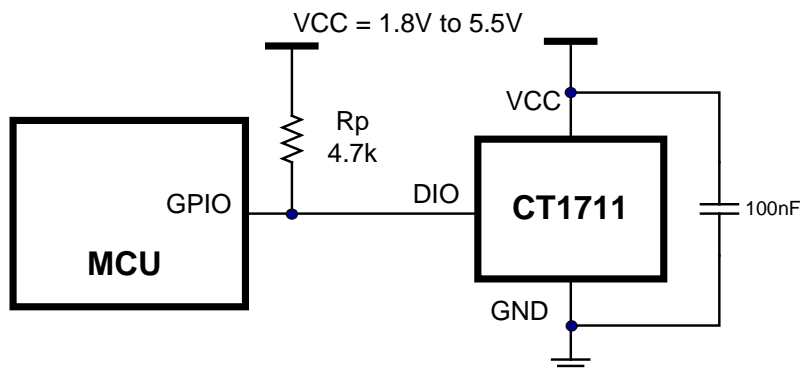


Figure 1. Typical Application of CT1711

**Pin Description**

PIN No.	PIN Name	Description
1	VCC	Power supply input pin, it should connect a 100nF to 1.0uF ceramic cap to ground.
2	GND	Ground pin.
3	DIO	Digital interface data input and output pin, Generally it needs a pull-up resistor (4.7k) to VCC in most applications.
4	GNDM	Metal CAN ground pin, short to GND pin in application.

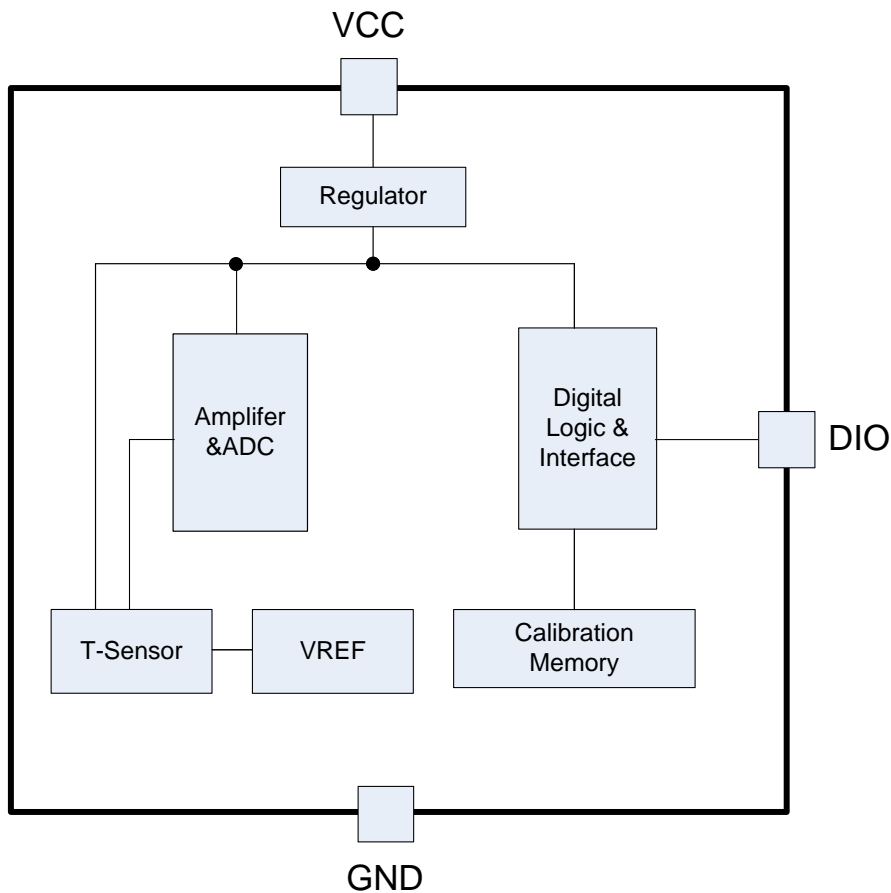
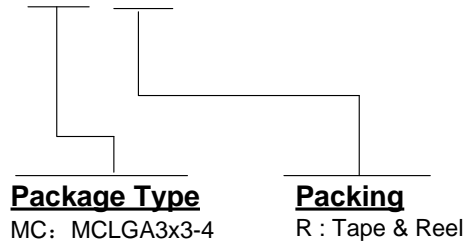
**Function Block**


Figure 2. CT1711 function block

**±0.1 °C Accuracy Digital Temperature Sensor with S-Wire Interface**
**Ordering Information**
**CT1711 X X**


Order PN	Accuracy	Green <sup>1</sup>	Package	Marking ID <sup>2</sup>	Packing	MPQ	Operation Temperature
CT1711MCR	±0.1°C	Halogen free	MCLGA3x3-4	1711 YWWAXX	Tape&Reel	4,000	-50°C~+150°C

**Notes**

1. Based on ROHS Y2012 spec, Halogen free covers lead free. So most package types Sensylink offers only states halogen free, instead of lead free.

2. Marking ID includes 2 rows of characters. In general, the 1<sup>st</sup> row of characters are part number, and the 2<sup>nd</sup> row of characters are date code plus production information.

- 1) Generally, date code is represented by 3 numbers. The number stands for year and work week information. e.g. 501 stands for the first work week of year 2015;621 stands for the 21st work week of year 2016.
- 2) Right after the date code information, the next 2-3 numbers or letters are specified to stands for supplier or production location information.
- 3) For very small outline package, there's 4 digits to stands for product information and date code, first 2 digits represent product code, and the other 2 digits stands for work week

## ±0.1 °C Accuracy Digital Temperature Sensor with S-Wire Interface

### Absolute Maximum Ratings (Note 3)

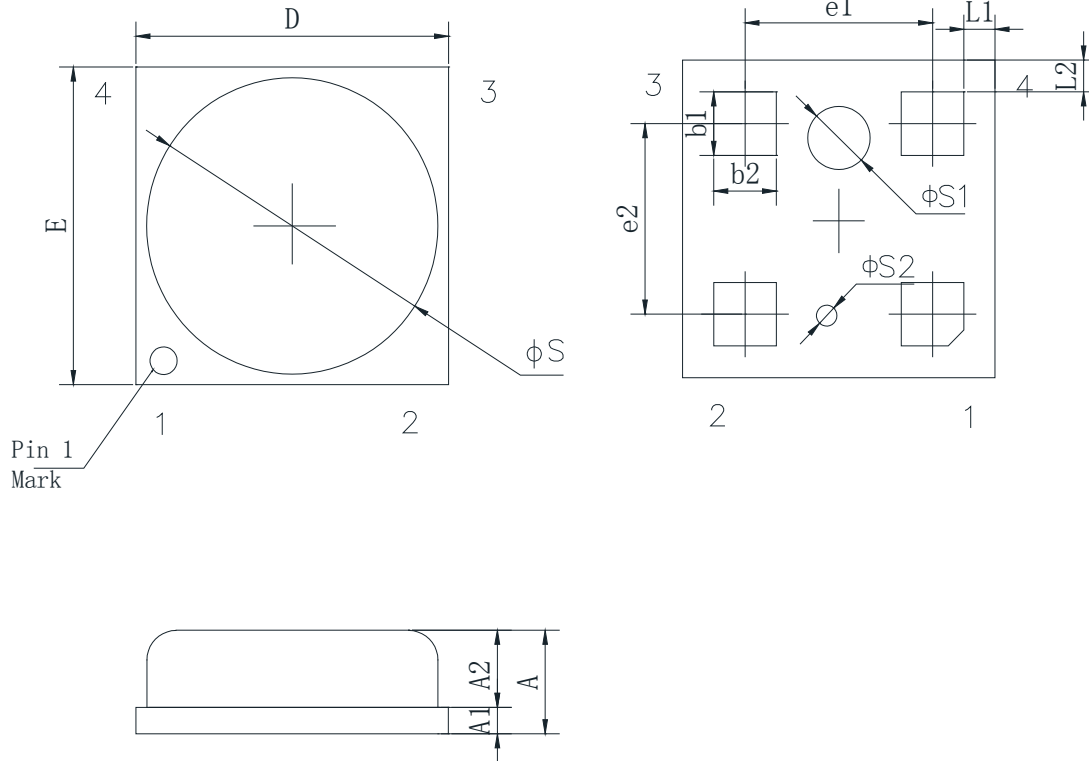
Parameter	Symbol	Value	Unit
Supply Voltage	$V_{CC}$ to GND	-0.3 to 5.5	V
I/O pin Voltage	$V_{IO}$ to GND	-0.3 to 5.5	V
Operation junction temperature	$T_J$	-50 to 150	°C
Storage temperature Range	$T_{STG}$	-65 to 150	°C
Lead Temperature (Soldering, 10 Seconds)	$T_{LEAD}$	260	°C
ESD MM	$ESD_{MM}$	500	V
ESD HBM	$ESD_{HBM}$	6000	V
ESD CDM	$ESD_{CDM}$	1000	V

#### Note 3

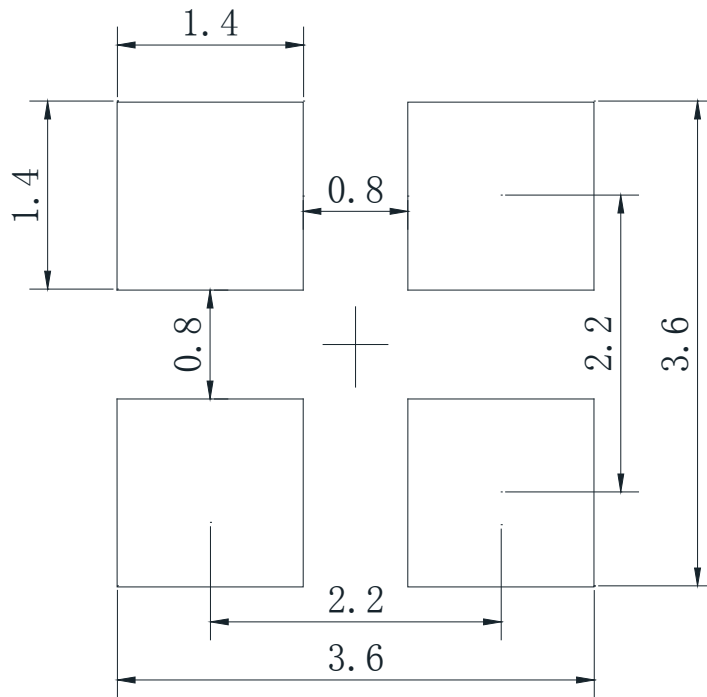
- Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at the "Absolute Maximum Ratings" conditions or any other conditions beyond those indicated under "Recommended Operating Conditions" is not recommended. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.
- Using 2oz dual layer (Top, Bottom) FR4 PCB with 4x4 mm<sup>2</sup> cooper as thermal PAD

### Recommended Operating Conditions

Parameter	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	1.8 ~ 5.5	V
Ambient Operation Temperature Range	$T_A$	-50 ~ +150	°C

**$\pm 0.1^\circ\text{C}$  Accuracy Digital Temperature Sensor with S-Wire Interface**
**Package Outline Dimensions (MCLGA3x3-4)**
**MCLGA3x3-4 Unit (mm)**


Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.200	0.300	0.008	0.012
A2	0.700	0.800	0.028	0.031
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
$\phi S$	2.700	2.900	0.106	0.114
$\phi S1$	0.550	0.650	0.022	0.026
$\phi S2$	0.150	0.250	0.006	0.010
b1	0.550	0.650	0.022	0.026
b2	0.550	0.650	0.022	0.026
e1	1.800YP.		0.072TYP	
e2	1.800YP.		0.072TYP	
L1	0.250	0.350	0.010	0.014
L2	0.250	0.350	0.010	0.014

**Recommended PCB Layout Pattern (MCLGA3x3-4)**
**MCLGA3x3-4      Unit (mm)**


Notes: All dimensions are in millimeters



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