

# GX100, GX101 High-precision, Low-power Digital Temperature Sensor Compatible with SMBus and I<sup>2</sup>C Communications

## 1 Features

- Product number: **GX100, GX101**
- Temperature range: **-55°C ~ +125°C**
- Temperature accuracy: **±0.5°C ( -40 °C ~ +125 °C )**
- Package form: **6-Pin SOT-23**
- Package size: **2.90 mm × 1.60 mm**
- Power supply voltage: **2.7V ~ 5.5V**
- Low quiescent current  
Temperature conversion: **≤ 40μA**  
Shutdown mode: **≤ 0.5μA**
- Resolution: **12bits, 0.0625 °C**
- Digital output: **compatible with SMBus and I<sup>2</sup>C interface**

## 2 Applications

- Power supply temperature monitoring
- laptop
- Battery management
- Thermostatic control

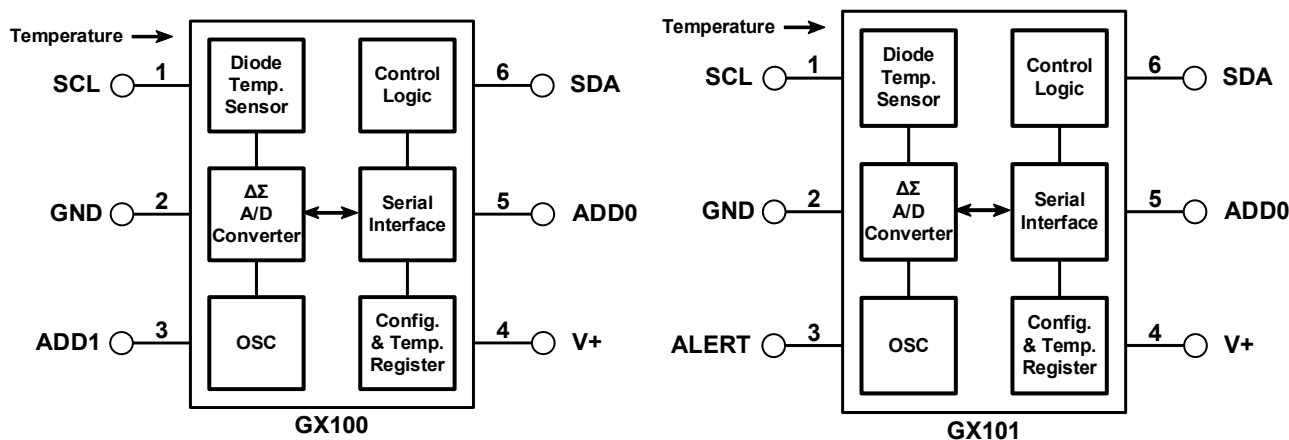
## 3 Description

The GX100 and GX101 are two high-precision, low-power digital temperature sensors that can replace NTC/PTC thermistors and can be used for temperature measurement in communications, computers, consumer electronics, environment, industry, and instrumentation applications. The GX100 and GX101 can provide temperature accuracy of  $\leq \pm 0.5^{\circ}\text{C}$  within the normal operating range of  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , and have good temperature linearity.

The rated operating voltage range of the GX100 and GX101 is 2.7~5.5V, and the quiescent operating current during temperature conversion is less than 40μA. The 12-bit ADC integrated inside the chip has a resolution as low as 0.0625°C.

The GX100 and GX101 are available in the 2.9mm×1.6mm SOT-23(6) package compatible with SMBus and I<sup>2</sup>C interfaces, and have the SMBus alarm function.

**Figure 1 the Diagram of the Internal Module**



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## Version Update Information

**V 1.0** (August 2022): The Original version;

**V 1.1** (August 2023): Updated the default value of the OS/ALERT bit in the configuration register to 1 (see Section 6.3.4), Added chip ordering information (see Section 9);

**V 1.2** (January 2024): Modified the error of the alarm function in Figure 4 (see Section 6.1.4);

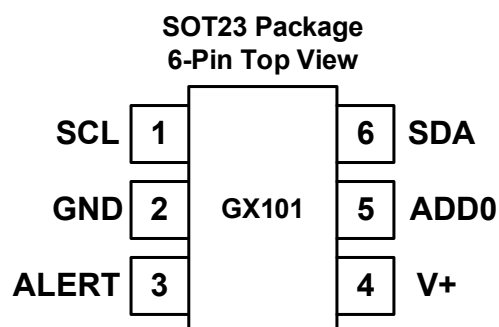
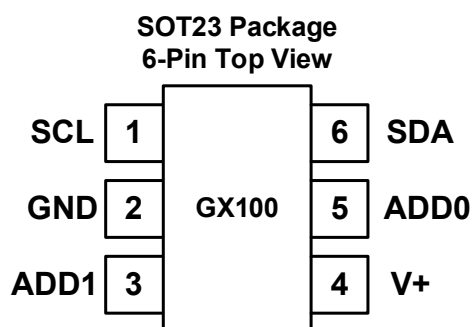
**V1.3** (December 2024): Updated the  $V_{ESD}$ 's Value of HBM (see Section 5.2) .

**V1.4** (August 2025): Updated the Typical Connections of the GX101 (see Figure 9).

## Table of Contents

|                                                   |          |                                          |           |
|---------------------------------------------------|----------|------------------------------------------|-----------|
| <b>1 Features</b> .....                           | <b>1</b> | <b>6 Detailed Description</b> .....      | <b>6</b>  |
| <b>2 Applications</b> .....                       | <b>1</b> | <b>6.1 Device Functional Modes</b> ..... | <b>6</b>  |
| <b>3 Description</b> .....                        | <b>1</b> | <b>6.2 Serial Interface</b> .....        | <b>8</b>  |
| <b>4 Pin Configuration and Functions</b> .....    | <b>3</b> | <b>6.3 Register Descriptions</b> .....   | <b>12</b> |
| <b>5 Specifications</b> .....                     | <b>4</b> | <b>7 Specific Applications</b> .....     | <b>15</b> |
| <b>5.1 Absolute Maximum Ratings</b> .....         | <b>4</b> | <b>8 Package Information</b> .....       | <b>16</b> |
| <b>5.2 Electrostatic Protection</b> .....         | <b>4</b> | <b>8.1 SOT23-6</b> .....                 | <b>16</b> |
| <b>5.3 Recommended Operating Conditions</b> ..... | <b>4</b> | <b>9 Ordering Information</b> .....      | <b>17</b> |
| <b>5.4 Electrical Characteristics</b> .....       | <b>5</b> |                                          |           |

## 4 Pin Configuration and Functions



## Pin Functions

| PIN   |       |       | DESCRIPTION                                                           |
|-------|-------|-------|-----------------------------------------------------------------------|
| NAME  | NO.   |       |                                                                       |
|       | GX100 | GX101 |                                                                       |
| SCL   | 1     | 1     | Serial clock. Open-drain output; requires pull-up resistor.           |
| GND   | 2     | 2     | Ground.                                                               |
| ALERT | —     | 3     | Over-temperature alarm. Open-drain output; requires pull-up resistor. |
| ADD1  | 3     | —     | Address selects. Connected to V+, GND, or left floating.              |
| V+    | 4     | 4     | Supply voltage, 2.7V~5.5V.                                            |
| ADD0  | 5     | 5     | Address selects. Connected to V+, GND, or left floating.              |
| SDA   | 6     | 6     | Serial data. Open-drain output; requires pull-up resistor.            |

## 5 Specifications

### 5.1 Absolute Maximum Ratings

|                               | MIN   | MAX                        | UNIT |
|-------------------------------|-------|----------------------------|------|
| Power Supply Voltage V+       |       | 6                          | V    |
| SCL, SDA and ADD0 Pin Voltage | - 0.5 | 6                          | V    |
| ALERT Pin Voltage             | - 0.5 | ((V +) + 0.3)<br>and ≤ 5.5 | V    |
| Operating Conditions          | - 55  | 1 25                       | °C   |
| Junction Temperature          |       | 1 50                       | °C   |
| Storage Temperature           | - 60  | 1 50                       | °C   |

Unless otherwise noted, the specifications in the above table apply within the atmospheric temperature range. Stresses beyond the range may cause permanent damage to the device.

### 5.2 Electrostatic Protection

|                                        |                                                   | Value | UNIT |
|----------------------------------------|---------------------------------------------------|-------|------|
| <b>Electrostatic Discharge Voltage</b> | Human Body Mode (HBM), per ANSI/ESDA/JEDEC JS-001 | ±8000 | V    |
|                                        | Machine Mode (MM), per JEDEC-STD Classification   | ±300  | V    |

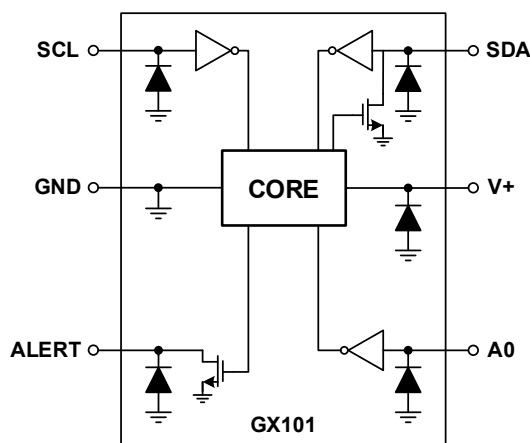


Figure 2 GX101 Internal ESD Equivalent Circuit

### 5.3 Recommended Operating Conditions

|                                      | MIN | NOM | MAX | UNIT |
|--------------------------------------|-----|-----|-----|------|
| Supply Voltage V+                    | 2.7 | 3.3 | 5.5 | V    |
| Operating Temperature T <sub>A</sub> | -50 |     | 125 | °C   |

Unless otherwise noted, the specifications in the above table apply within the atmospheric temperature range.

## 5.4 Electrical Characteristics

Unless otherwise specified, the following data are the characteristics of the chip at + 25°C and the power supply voltage is in the range of 2.7 V~ 5.5 V.

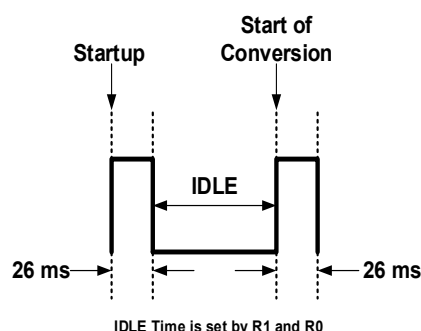
| PARAMETER                          | TEST CONDITONS           | MIN   | TYP    | MAX   | UNIT |
|------------------------------------|--------------------------|-------|--------|-------|------|
| Operating Temperature              |                          | - 55  |        | 125   | °C   |
| Accuracy (Temperature Error)       | +25°C, V+ = 3.3V         |       | ±0.1   | ±0.5  | °C   |
|                                    | 0°C to +65°C, V+ = 3.3V  |       | ±0.25  | ±0.5  | °C   |
|                                    | -40°C to +125°C          |       | ±0.5   | ±1    | °C   |
| Power Supply Sensitivity           | -40°C to +125°C          |       | 0.0625 | ±0.25 | °C/V |
| Resolution                         |                          |       | 0.0625 |       | °C   |
|                                    |                          |       | 1 2    |       | bits |
| Conversion Time                    |                          |       | 2 6    | 3 5   | ms   |
| Temperature Measurement Resolution | R1 = 0, R0 = 0 (default) |       | 9      |       | bits |
|                                    | R1 = 0, R0 = 1           |       | 1 0    |       |      |
|                                    | R1 = 1, R0 = 0           |       | 11     |       |      |
|                                    | R1 = 1, R0 = 1           |       | 1 2    |       |      |
| Temperature Refresh Interval       | R1 = 0, R0 = 0 (default) |       | 4 0    |       | ms   |
|                                    | R1 = 0, R0 = 1           |       | 8 0    |       |      |
|                                    | R1 = 1, R0 = 0           |       | 1 60   |       |      |
|                                    | R1 = 1, R0 = 1           |       | 3 20   |       |      |
| Timeout Time                       |                          |       | 3 0    | 4 0   | ms   |
| Bus Communication Frequency        | Quick mode               | 0.001 |        | 0.4   | MHz  |
|                                    | High speed mode          | 0.001 |        | 2.5   |      |
| Power Supply Voltage               |                          | 2.7   | 3.3    | 5.5   | V    |
| Conversion Current                 | bus free                 |       | 4 0    | 7 5   | μ A  |
|                                    | Bus occupancy, SCL       |       | 70     |       |      |
|                                    | Bus occupancy, SCL       |       | 150    |       |      |
| Shutdown Current                   | bus free                 |       | 0.3    | 3     | μ A  |
|                                    | Bus occupancy, SCL       |       | 20     |       |      |
|                                    | Bus occupancy, SCL       |       | 100    |       |      |

## 6 Detailed Description

### 6.1 Device Functional Modes

#### 6.1.1 Continuous Conversion Mode

The default working mode of the GX100 and GX101 is continuous conversion mode, and the typical conversion time is 26ms. During continuous conversion mode, the ADC performs continuous temperature conversions and stores each result to the temperature register, overwriting the result from the previous conversion. The conversion rate bits, R1 and R0, configure the GX100 and GX101 for conversion rates of 9bits, 10bits, 11bits or 12bits and adjust the temperature refresh interval accordingly. After each temperature measurement is completed, the chip will enter a low-power idle state ( $\leq 3\mu A$ ) until the next temperature measurement begins. The duration of the idle state is determined by R1 and R0. The above process is shown in Figure 3.



**Figure 3. Schematic Diagram of Continuous Conversion**

The temperature measurement range of the GX100 and GX101 is  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ . The read-only temperature register in GX100 and GX101 uses two bytes to store the temperature measurement results, as shown in Table 1. Byte 1 is the MSB, byte 2 is the LSB, the high 12 bits are used to indicate the temperature, and the remaining low bits are 0. When R1 and R0 configure the temperature measurement resolution to 9 bits, 10 bits or 11 bits, the high 9, 10 and 11 bits of the temperature register are used to store the temperature measurement results, and the remaining low bits are 0.

The temperature registers of the GX100 and GX101 use the binary complement form to represent the negative temperature results. When powered on or reset, the temperature registers of the GX100 and GX101 will be set to 00h until the next temperature conversion is complete.

**Table 1. 12-bit Temperature Data Format in Normal Temperature Measurement Mode**

| TEMPERATURE (°C) | DIGITAL OUPUT (BINARY) | HEX |
|------------------|------------------------|-----|
| 128              | 0111 1111 1111         | 7FF |
| 127.9375         | 0111 1111 1111         | 7FF |
| 100              | 0110 0100 0000         | 640 |
| 50               | 0011 0010 0000         | 320 |
| 25               | 0001 1001 0000         | 190 |
| 0.25             | 0000 0000 0100         | 004 |
| 0                | 0000 0000 0000         | 000 |
| -0.25            | 1111 1111 1100         | FFC |
| -25              | 1110 0111 0000         | E70 |
| -55              | 1100 1001 0000         | C90 |

### 6.1.2 Shutdown Mode

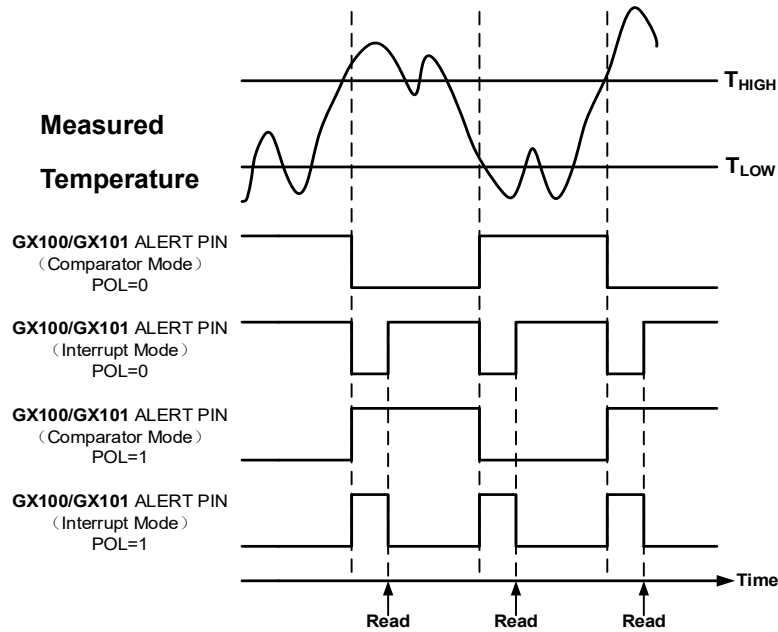
The shutdown mode of the GX100 and GX101 device allows the user to conserve power by shutting down all device circuitry except the serial interface, thereby reducing the current of the GX100 and GX101 to less than 0.5 $\mu$ A. The shutdown mode is initiated when the SD bit in the configuration register is set to 1; after configuring the registers in this way, the GX100 and GX101 will shut down after completing the current conversion. To exit the shutdown mode, write SD bit to 0, the GX100 and GX101 will re-enter continuous conversion mode.

### 6.1.3 One-Shot Mode

The GX100 and GX101 can be configured in the One-Shot mode. When the GX100 and GX101 are in the shutdown mode, writing 1 to the OS/ALERT bit in the configuration register starts a single temperature conversion. The GX100 and GX101 feature a one-shot mode. When the GX100 and GX101 are in the shutdown mode, writing 1 to the OS bit starts a single temperature conversion. During the conversion, the OS bit reads 0. The GX100 and GX101 return to the shutdown state at the completion of the single conversion, the OS bit reads 1. When continuous temperature measurement is not required, this function can significantly reduce chip power consumption.

#### 6.1.4 Alarm Function (ALERT)

The GX100 and GX101 have a temperature alarm function, by writing the TM bit in the configuration register as 0 or 1, the GX100 and GX101 can be configured as the comparator mode or the interrupt mode to achieve different alarm functions.



**Figure 4. Status of the ALERT Pin in Different Modes**

In the comparison mode (TM=0), when the number of times the temperature measurement result continuously equals or exceeds the temperature upper limit register value  $T_{HIGH}$  reaches the value defined by the F1/F0 bits in the configuration register (as shown in Table 2), the ALERT pin will be activated. The ALERT pin will remain active until the number of times the temperature measurement result is continuously lower than the temperature lower limit register value  $T_{LOW}$  reaches the value defined by F1/F0.

In the interrupt mode (TM=1), the ALERT pin will be activated when the temperature measurement result equals or exceeds  $T_{HIGH}$  continuously for a number of times to the value defined by F1/F0 (as shown in Table 2). The ALERT pin remains active until it is cleared by one of three events: a read of any register, a successful SMBus alert response, or a shutdown command. After the ALERT pin is cleared, the device starts to compare temperature readings with the  $T_{LOW}$ . The ALERT pin becomes active again only when the temperature drops below  $T_{LOW}$  for a consecutive number of conversions as set by F1/F0 bits. The ALERT pin remains active until cleared by any of the same three clearing events. The user can also reset the GX100 and GX101 to clear the ALERT pin state by using the global response reset command (General Call). This operation also resets other internal registers in the GX100 and GX101 and returns the device to compare mode (TM=0). Table 2 shows the specific configuration of the F1/F0 bits.

**Table 2 Number of Over-temperature Required to Activate the ALERT Pin**

| <b>F1</b> | <b>F 0</b> | <b>REQUIRED NUMBER (TIMES)</b> |
|-----------|------------|--------------------------------|
| 0         | 0          | 1 time (Default)               |
| 0         | 1          | 2 times                        |
| 1         | 0          | 4 times                        |
| 1         | 1          | 6 times                        |

The polarity bit (POL) in the configuration register allows the user to adjust the polarity of the ALERT pin output. If the POL bit is set to 0 (default), the ALERT pin becomes active low. When POL bit is set to 1, the ALERT pin becomes active high. The above situations are shown in [Figure 4](#).

The OS/ALERT bit in the configuration register can also display the alarm status of the chip in the comparison mode. When POL=0, when the number of times the temperature measurement result continuously equals or exceeds the temperature upper limit register value  $T_{HIGH}$  reaches the value defined by the F1/F0 bits in the configuration register, the OS/ALERT bit will change from 1 to 0; when the number of times the temperature measurement result continuously equals or exceeds the temperature upper limit register value  $T_{HIGH}$  reaches the value defined by the F1/F0 bits in the configuration register, the OS/ALERT bit will change from 0 to 1. When POL=1, the value of the OS/ALERT bit in the above process will be inverted.

The OS/ALERT bit is not affected by the TM bit. The OS/ALERT bit is 0 when powered on or reset, and will be set to 1 immediately by the above function.

## **6.2 Serial Interface**

### **6.2.1 Bus Overview**

The GX100 and GX101 is compatible with SMBus and I<sup>2</sup>C interfaces. In the SUMBus protocol, the device that initiates the transfer is called a master, and the devices controlled by the master are slaves. The bus must be controlled by a master device that generates the serial clock (SCL), controls the bus access, and generates the START and STOP conditions. To address a specific device, a START condition is initiated, indicated by pulling the data line (SDA) from a high- to low-logic level when the SCL pin is high. All slaves on the bus receive the 8-bits slave address on the rising edge of the clock, and the last bit indicates whether a read or write operation is intended. During the ninth clock pulse, the addressed slave generates an acknowledge and pulls the SDA pin low to respond to the master. A data transfer is then initiated and sent over eight clock pulses followed by an acknowledge bit. When all data are transferred, the master generate a STOP signal to end the communication by pulling SDA from low to high when SCL is high.

During the data transfer, the SDA pin must remain stable when the SCL pin is high because any change in the SDA pin when the SCL pin is high is interpreted as a START or STOP signal.

## 6.2.2 Serial Bus Address

To communicate with the GX100 and GX101, the master must first address slave devices through an address byte. The address byte has seven address bits and a read-write (R/W) bit that indicates the intent of executing a read or write operation. The GX100 has two address pins, which can generate up to 8 different slave addresses; The GX101 has one address pin, which can generate up to 3 different slave addresses. By connecting the address pins to V+, GND or floating, the host can address up to 8 GX100s with different addresses or 3 GX101s with 3 different addresses on a single bus. [Table 3](#) and [Table 4](#) give the connection method of the ADD0 pin corresponding to each slave address.

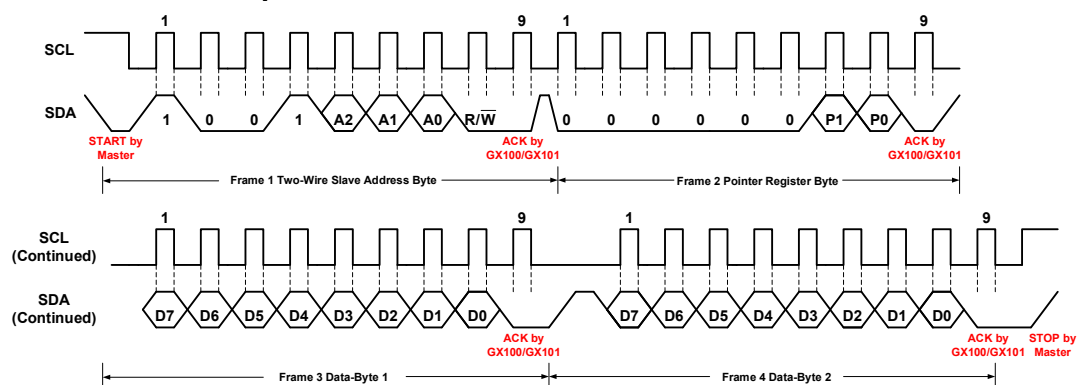
**Table 3 Address Pin and Slave Addresses in GX100**

| ADD1  | ADD0  | slave address |
|-------|-------|---------------|
| 0     | 0     | 1 001000      |
| 0     | Float | 1 001001      |
| 0     | 1     | 1 001010      |
| 1     | 0     | 1 001100      |
| 1     | Float | 1 001101      |
| 1     | 1     | 1 001110      |
| Float | 0     | 1 001011      |
| Float | 1     | 1 001111      |

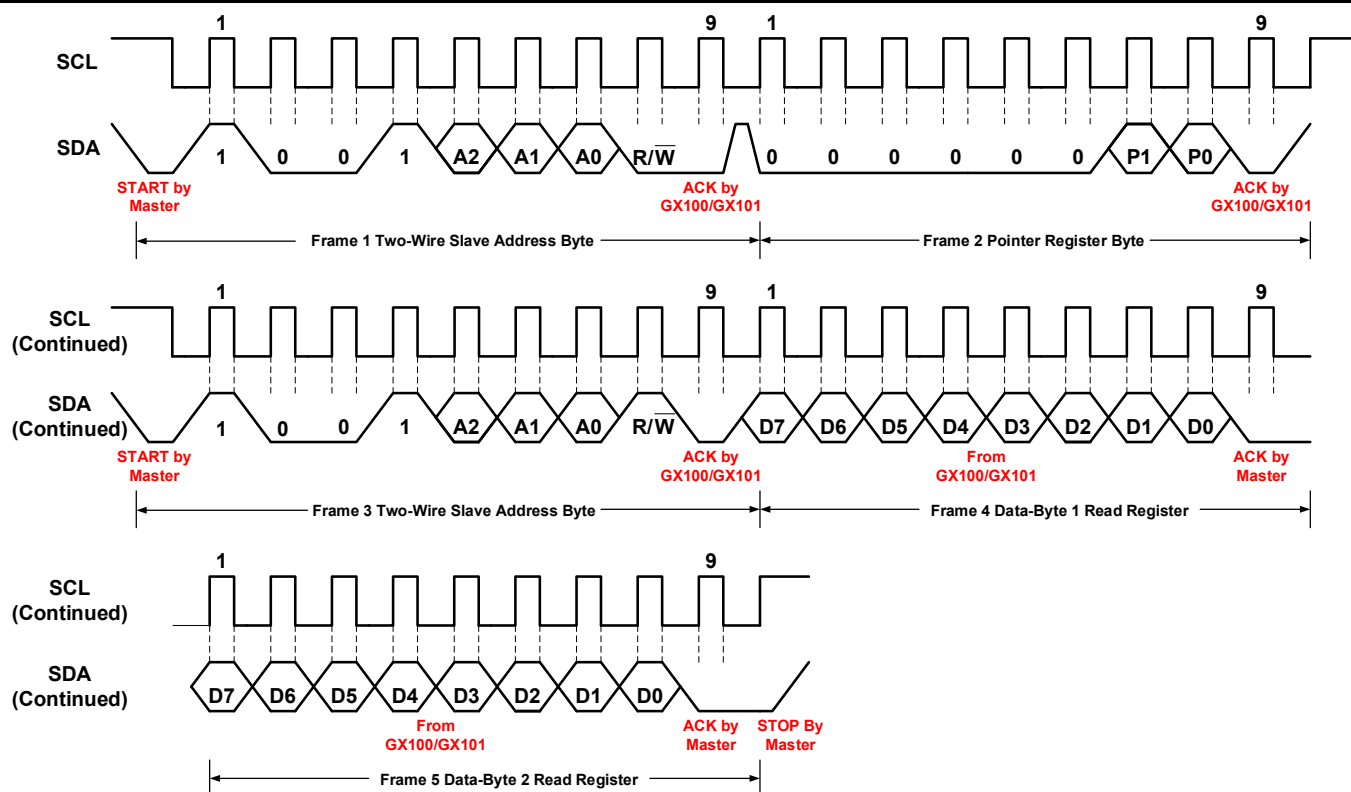
**Table 4 Address Pin and Slave Addresses in GX101**

| ADD0  | slave address |
|-------|---------------|
| 0     | 1 001000      |
| Float | 1 001001      |
| 1     | 1 001010      |

## 6.2.3 Read and Write Operations



**Figure 5. Two-wire Write Command Timing Diagram**



**Figure 6. Two-wire Write Command Timing Diagram**

When writing data to the GX100 and GX101, after the slave address byte is sent, accessing a particular register on the GX100 and GX101 is accomplished by writing the appropriate value to the pointer register. Every write operation to the GX100 and GX101 requires a value for the pointer register.

When reading from the GX100 and GX101 device, after the slave address byte is sent, the corresponding pointer register byte also needs to be sent. Unlike the write operation, if the user needs to repeatedly read data from the same register, it is not required to send the pointer register byte separately each time, the last value stored in the pointer register will be read by the device automatically; to change the register pointer for a read operation, a new value must be written to the pointer register. The action is accomplished by issuing a slave-address byte with the  $R/\overline{W}$  bit low, followed by the pointer register byte. The master can then generate a START condition and send the slave address byte with the  $R/\overline{W}$  bit high to initiate the read command.

It should be noted that register bytes are sent with the MSB first, followed by the LSB. [Figure 5](#) and [Figure 6](#) show schematic diagrams of the above read and write operations.

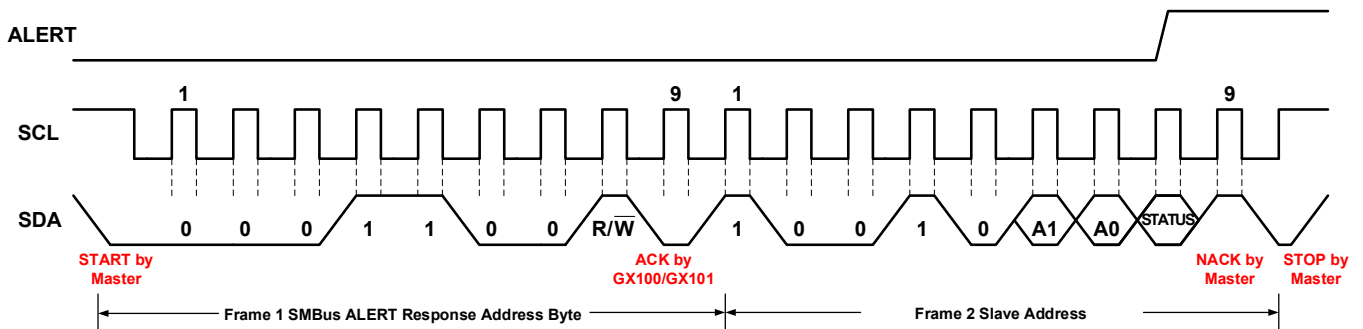
#### 6.2.4 SMBus Alarm Function

The GX100 and GX101 supports the SMBus alert function. When the GX100 and GX101 operates in interrupt mode (TM=1), the master can send out and SMBus ALERT command (19h) to the bus. If the ALERT pin is active,

the device acknowledges the SMBus ALERT command and responds by returning the slave address. The eighth bit (LSB) of the slave address byte indicates if the alert condition is caused by the temperature exceeding  $T_{HIGH}$  or falling below  $T_{LOW}$ . This bit is equal to POL if the temperature is greater than or equal to  $T_{HIGH}$ ; this bit is equal to POL if the temperature is less than  $T_{LOW}$ .

If multiple devices on the bus respond to the SMBus ALERT command, the bus will return the lowest two-wire address. The GX100 and GX101 ALERT pin becomes inactive at the completion of the SMBus ALERT command; the ALERT pin of the GX100 and GX101 that does not return an address will remain active. Sending the SMBus ALERT command again can continue to clear the ALERT pin of the GX100 and GX101 with the current lowest address. The above process is detailed in [Figure 7](#).

The GX100 acts the same as the GX101 after sending the SMBus alarm command. The ALERT pins cannot be cleared without the ALERT pins, but can still return the slave address that activates the alarm.



**Figure 7 SMBus Alert Timing Diagram**

### 6.2.5 General Call Reset

The GX100 and GX101 responds to the two-wire general call address 00h. The device acknowledges the general call address and responds to commands in the second byte. If the second byte is 06h, the GX100 and GX101 resets the internal registers to the power-up reset values, and aborts the current temperature conversion. If the second byte is other value, the GX100 and GX101 will not respond.

### 6.2.6 High-Speed Mode

For the two-wire bus to operate at frequencies above 400kHz, the host device must issue a High-Speed mode host code (0000 1xxx) as the first byte after a START condition to switch the bus to high-speed operation. The GX100 and GX101 device does not acknowledge this byte, but it does switch the input filters on the SDA and SCL and the output filters on the SDA to operate in High-Speed mode, allowing the bus to transmit data at frequencies up to 2.75MHz. After the High-Speed mode host code is issued, the host transmits a two-wire device address to initiate

a data transfer operation. The bus continues to operate in High-Speed mode until a STOP condition occurs on the bus. Upon receiving the STOP condition, the GX100 and GX101 switches the input and output filters back to fast-mode operation.

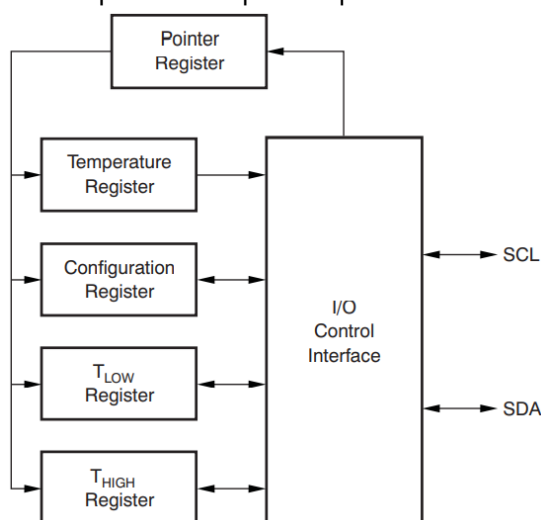
## 6.2.7 Time-Out Function

The GX100 and GX101 resets the serial interface if SCL is held low for 30ms (typical) between a START and STOP condition, the GX100 and GX101 releases the SDA bus and waits for a START condition. To avoid activating the Time-Out function, a communication speed of at least 1kHz must be maintained.

## 6.3 Register Descriptions

### 6.3.1 Pointer Register

Figure 8 shows the internal register structure of the GX100 and GX101 device. The 8-bit Pointer Register of the device is used to address a given data register. The Pointer Register uses the two LSBs (see Table 6) to identify which of the data registers must respond to a read or write command. The power-up reset value of P1/P0 is '00'. By default, the GX100 and GX101 reads the temperature on power-up.



**Figure 8. Internal Register Structure**

Table 5 lists the pointer address of the registers available in the GX100 and GX101 device. During a write command, bytes P2 through P7 must always be 0.

**Table 5. Pointer Address**

| P1 | P0 | REGISTER                                |
|----|----|-----------------------------------------|
| 0  | 0  | Temperature Register (Read Only)        |
| 0  | 1  | Configuration Register (Read/Write)     |
| 1  | 0  | T <sub>LOW</sub> Register (Read/Write)  |
| 1  | 1  | T <sub>HIGH</sub> Register (Read/Write) |

**Table 7. Pointer Register Byte**

| P7 | P6 | P5 | P4 | P3 | P2 | P1            | P0 |
|----|----|----|----|----|----|---------------|----|
| 0  | 0  | 0  | 0  | 0  | 0  | Register Bits |    |

### 6.3.2 Temperature Register

The Temperature Register of the GX100 and GX101 device is configured as a 12-bit read-only register that stores the output of the most recent conversion. Two bytes must be read to obtain data and are listed in Table 7. Byte 1 is the most significant byte (MSB), followed by byte 2, the least significant byte (LSB). The T11~T0 bits (T12~T0 bits in extended mode) are used to indicate temperature.

**Table 7 Data Format of Temperature Register**

| BYTE | D7  | D6  | D5 | D4 | D3 | D2 | D1 | D0 |
|------|-----|-----|----|----|----|----|----|----|
| 1    | T11 | T10 | T9 | T8 | T7 | T6 | T5 | T4 |
| 2    | T3  | T2  | T1 | T0 | 0  | 0  | 0  | 0  |

### 6.3.3 Temperature Limit Register

The temperature limits are stored in the T<sub>HIGH</sub> and T<sub>LOW</sub> registers in the same format as the temperature result. Table 10 and Table 11 list the format for the T<sub>HIGH</sub> and T<sub>LOW</sub> registers. When the temperature measurement resolution of the chip is 9~11 bits, the 12bits data of the THIGH and TLOW registers also participate in the temperature comparison of the alarm function. The power-on reset values of the T<sub>HIGH</sub> and T<sub>LOW</sub> registers are:

- T<sub>HIGH</sub> = +80°C; T<sub>LOW</sub> = +75°C

**Table 8 Byte 1 and 2 of T<sub>HIGH</sub> Register**

| BYTE | D7  | D6  | D5 | D4 | D3 | D2 | D1 | D0 |
|------|-----|-----|----|----|----|----|----|----|
| 1    | H11 | H10 | H9 | H8 | H7 | H6 | H5 | H4 |
| 2    | H3  | H2  | H1 | H0 | 0  | 0  | 0  | 0  |

**Table 9 Byte 1 and 2 of T<sub>LOW</sub> Register**

| BYTE | D7  | D6  | D5 | D4 | D3 | D2 | D1 | D0 |
|------|-----|-----|----|----|----|----|----|----|
| 1    | L11 | L10 | L9 | L8 | L7 | L6 | L5 | L4 |
| 2    | L3  | L2  | L1 | L0 | 0  | 0  | 0  | 0  |

### 6.3.4 Configuration Register

The Configuration Register of the GX100 and GX101 is an 8-bit read/write register used to store bits that control the operational modes of the temperature sensor. Table 10 list the format and power-up and reset values of the configuration register.

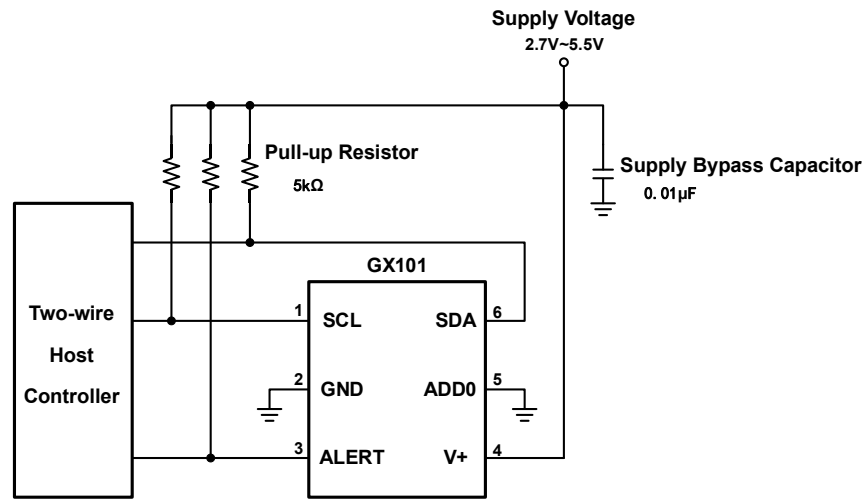
**Table 10 Data Format and Function OF THE Configuration Register**

| BIT | FIELD         | DEFAULT | DESCRIPTION                                                                                                                                                                 |
|-----|---------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7   | OS /ALERT (R) | 1       | <b>One-Shot and Interrupt Mode Alarm Flag Bit</b>                                                                                                                           |
| 6   | R1(R/W)       | 0       | <b>Temperature Measurement Resolution Flag</b><br><b>00</b> =9 bits, 0.5° C<br><b>01</b> =10 bits, 0.25° C<br><b>10</b> =11 bits, 0.125° C<br><b>11</b> =12 bits, 0.0625° C |
| 5   | R 0 (R/W)     | 0       |                                                                                                                                                                             |
| 4   | F1 (R/W)      | 0       |                                                                                                                                                                             |
| 3   | F0 (R/W)      | 0       | <b>The Number of Over-temperature Flags Required to Activate the ALERT Pin</b><br><b>00</b> = 1 time<br><b>01</b> = 2 times<br><b>10</b> = 4 times<br><b>11</b> = 6 times   |
| 2   | POL (R/W)     | 0       | <b>ALERT Pin Polarity Flag</b><br><b>1</b> =ALERT pin is high when activated<br><b>0</b> =ALERT pin is low when activated                                                   |
| 1   | TM (R/W)      | 0       | <b>Chip Working Mode Flag under ALERT Function</b><br><b>1</b> =interrupt mode<br><b>0</b> =compare mode                                                                    |
| 0   | SD (R/W)      | 0       | <b>Shutdown Mode Flag</b><br><b>1</b> =shutdown mode<br><b>0</b> =continuous conversion mode                                                                                |

## 7 Specific Applications

### NOTE

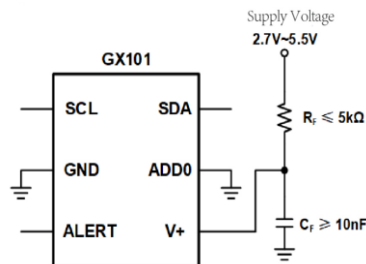
The above contents are the precautions for the GX709 recommended by Beijing Galaxy-CAS Technology Co., Ltd. in practical applications. Customers are responsible for determining suitability of components for their purposes based on their own usage needs and application scenarios. Customers should test and verify their design implementation to confirm system functionality and avoid losses.



**Figure 9 Typical Connections of the GX101**

The GX100 and GX101 device requires pull-up resistors on the SCL, SDA, and ALERT pins, as shown in [Figure 9](#), the recommended value for the pull-up resistors is 5kΩ. In some applications the pull-up resistor can be lower or higher than 5kΩ but must not exceed 3mA of current on any of those pins.

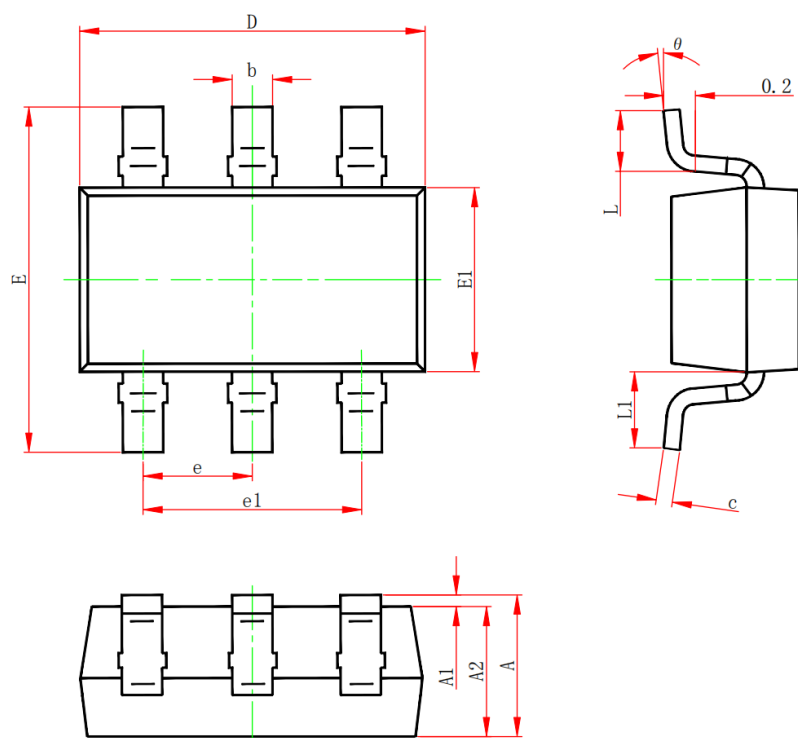
The GX100 and GX101 device is a very low-power device and generates very low noise on the supply bus. Applying an RC filter to the V+ pin of the GX100 and GX101 device can further reduce any noise that the device might propagate to other components.  $R_F$  in [Figure 10](#) must be less than 5kΩ and  $C_F$  must be more than 10nF.



**Figure 10 Noise Reduction Technology**

The GX100 and GX101 should be placed near the heat source that must be monitored, with a proper layout for good thermal coupling. This placement ensures that temperature changes are captured within the shortest possible time interval. To maintain accuracy in applications that require air or surface temperature measurement, take care to isolate the package and leads from ambient air temperature. A thermally-conductive adhesive is helpful in achieving accurate surface temperature measurement.

## 8 Package Information



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 1.050                     | 1.150 | 0.041                | 0.045 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.100                     | 0.200 | 0.004                | 0.008 |
| D        | 2.820                     | 3.020 | 0.111                | 0.119 |
| E1       | 1.500                     | 1.700 | 0.059                | 0.067 |
| E        | 2.650                     | 2.950 | 0.104                | 0.116 |
| e        | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.300                     | 0.600 | 0.012                | 0.024 |
| L1       | 0.600REF.                 |       | 0.024REF.            |       |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

## 9 Ordering Information

| Order Number | Chip Model | Package  | SPQ  | Note        |
|--------------|------------|----------|------|-------------|
| GX100S-T&R   | GX100S     | SOT 23-6 | 3000 | Tape & Reel |
| GX101S-T&R   | GX101S     | SOT 23-6 | 3000 | Tape & Reel |