# 5.5V, 42-μA, RRIO, Zero-Drift Operational Amplifier

## Features

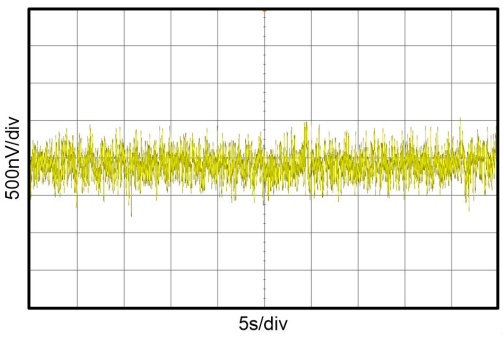
- Low Offset Voltage: 10 μV (Max)
- Zero Drift: 0.008 μV/℃
- 0.1-Hz to 10-Hz Noise: 1.1 $\mu V_{PP}$
- Low Supply Current: 42 μA per Amplifier
- Bandwidth: 350 kHz
- Slew Rate: 0.16 V/μs
- High-Gain, 130-dB High CMRR and PSRR
- Rail-to-Rail Input and Output Swing
- Operating Temperature Range: −40°C to 125°C
- Small Packages: SOT353 (SC70-5) and SOT23-5

## Applications

- Transducer Amplifier
- Bidirectional Current Sense
- DC Offset Correction
- Temperature Measurement
- Remote Located Sensors
- Battery-Powered Instruments
- Electronic Weigh Scales

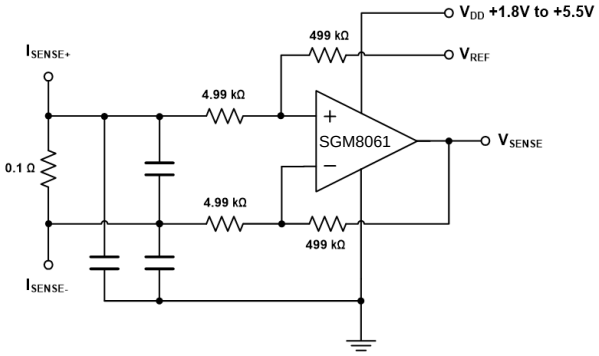
**Related Zero-Drift Op Amps**

| | | |
|---|---|---|
| **$V_{OS}$ (Max)** | 10 μV | 5 μV |
| **GBWP** | 350 kHz | 3.5 MHz |
| **Supply Current** | 42 μA | 500 μA |
| **$e_N$ at 1 kHz** | 55 nV/√Hz | 15 nV/√Hz |
| **Single** | SGM8061 | SGM8071 |
| **Dual** | SGM8062 | SGM8072 |
| **Quad** | SGM8064 | SGM8074 |

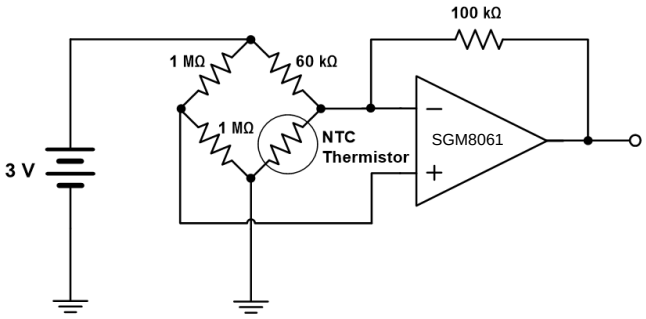



**0.1-Hz to 10-Hz Noise**

# Typical Application Circuit



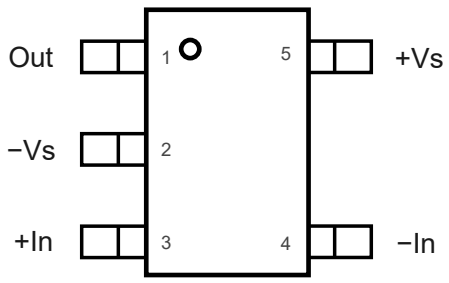

**Bi-Directional Current Sense Amplifier**




**Thermistor Measurement**

## Pin Configuration and Functions

SGM8061
SOT23-5/SOT353 (SC70-5)
Top View




SGM8061U
SOT23-5/SOT353 (SC70-5)
Top View

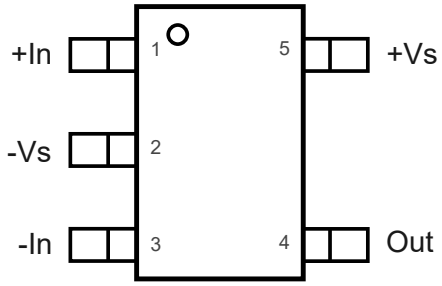



**Table 1. Pin Functions: SGM8061, SGM8061U**

| Pin No. | | Name | I/O | Description |
|---|---|---|---|---|
| SGM8061 | SGM8061U | | | |
| 1 | 4 | Out | O | Output of the amplifier. The voltage range extends to within millivolts of each supply rail. |
| 2 | 2 | $-V_S$ | Power Supply | Negative power supply. It is normally tied to GND. It can also be tied to a voltage other than GND when the voltage between $+V_S$ and $-V_S$ is from 1.8 V to 5.5 V. If it is not connected to GND, bypass it with a capacitor of 0.1 μF to the part as close as possible. |
| 3 | 1 | +In | I | Non-inverting input of the amplifier. |
| 4 | 3 | −In | I | Inverting input of the amplifier. |
| 5 | 5 | $+V_S$ | Power Supply | Positive power supply. Typically, the voltage is from 1.8 V to 5.5 V. Split supplies are possible when the voltage between $+V_S$ and $-V_S$ is between 1.8 V and 5.5 V. A bypass capacitor of 0.1 μF to the part as close as possible should be used between the power supply pins or between supply pins and GND. |

SGM8061
SOP8
Top View

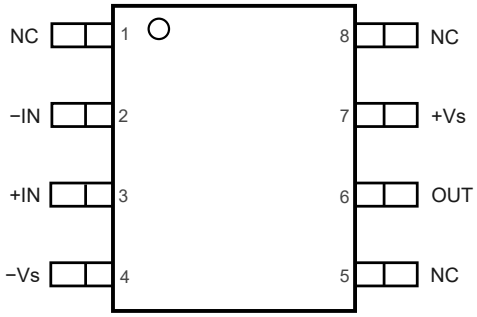
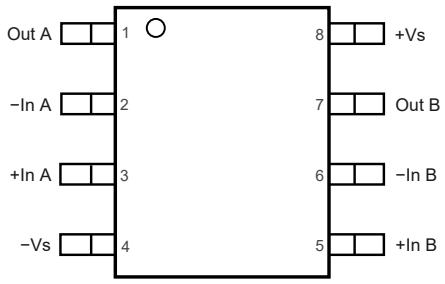



**Table 2. Pin Functions: SGM8061**

| Pin No. | Name | I/O | Description |
|---|---|---|---|
| 1 | NC | | Not connected. |
| 2 | −IN | I | Inverting input of the amplifier. |
| 3 | +IN | I | Non-inverting input of the amplifier. |
| 4 | $-V_S$ | Power Supply | Negative power supply. It is normally tied to GND. It can also be tied to a voltage other than GND when the voltage between $+V_S$ and $-V_S$ is from 1.8 V to 5.5 V. If it is not connected to GND, bypass it with a capacitor of 0.1 μF to the part as close as possible. |
| 5 | NC | | Not connected. |
| 6 | Out | O | Amplifier output. The voltage range extends to within mV of each supply rail. |
| 7 | $+V_S$ | Power Supply | Positive power supply. Typically, the voltage is from 1.8 V to 5.5 V. Split supplies are possible when the voltage between $+V_S$ and $-V_S$ is between 1.8 V and 5.5 V. A bypass capacitor of 0.1 μF to the part as close as possible should be used between the power supply pins or between supply pins and ground. |
| 8 | NC | | Not connected. |

SGM8062
SOP8/MSOP8
Top View




SGM8062
DFN2X2-8
Top View

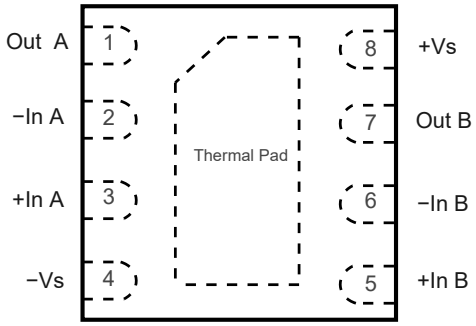



**Table 3. Pin Functions: SGM8062**

| Pin No. | Name | I/O | Description |
|---|---|---|---|
| 1 | Out A | O | Output of the amplifier. The voltage range extends to within millivolts of each supply rail. |
| 2 | −In A | I | Inverting input of the amplifier. |
| 3 | +In A | I | Non-inverting input of the amplifier. |
| 4 | $-V_S$ | Power Supply | Negative power supply. It is normally tied to GND. It can also be tied to a voltage other than GND when the voltage between $+V_S$ and $-V_S$ is from 1.8 V to 5.5 V. If it is not connected to GND, bypass it with a capacitor of 0.1 μF to the part as close as possible. |
| 5 | +In B | I | Non-inverting input of the amplifier. |
| 6 | −In B | I | Inverting input of the amplifier. |
| 7 | Out B | O | Output of the amplifier. The voltage range extends to within millivolts of each supply rail. |
| 8 | $+V_S$ | Power Supply | Positive power supply. Typically, the voltage is from 1.8 V to 5.5 V. Split supplies are possible when the voltage between $+V_S$ and $-V_S$ is between 1.8 V and 5.5 V. A bypass capacitor of 0.1 μF to the part as close as possible should be used between the power supply pins or between supply pins and GND. |
| | Thermal Pad | | The thermal pad of the DFN2X2-8 package is recommended to be floating or connected to $-V_S$. |

SGM8064
SOP14/TSSOP14
Top View

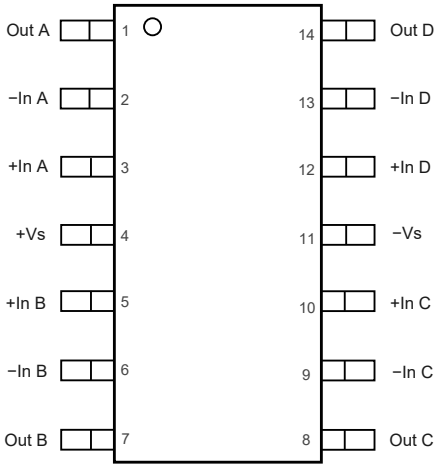



**Table 4. Pin Functions: SGM8064**

| Pin No. | Name | I/O | Description |
|---|---|---|---|
| 1 | Out A | O | Output of the amplifier. The voltage range extends to within millivolts of each supply rail. |
| 2 | −In A | I | Inverting input of the amplifier. |
| 3 | +In A | I | Non-inverting input of the amplifier. |
| 4 | $+V_S$ | Power Supply | Positive power supply. Typically, the voltage is from 1.8 V to 5.5 V. Split supplies are possible when the voltage between $+V_S$ and $-V_S$ is between 1.8 V and 5.5 V. A bypass capacitor of 0.1 μF to the part as close as possible should be used between the power supply pins or between supply pins and GND. |
| 5 | +In B | I | Non-inverting input of the amplifier. |
| 6 | −In B | I | Inverting input of the amplifier. |
| 7 | Out B | O | Output of the amplifier. The voltage range extends to within millivolts of each supply rail. |
| 8 | Out C | O | Output of the amplifier. The voltage range extends to within millivolts of each supply rail. |
| 9 | −In C | I | Inverting input of the amplifier. |
| 10 | +In C | I | Non-inverting input of the amplifier. |
| 11 | $-V_S$ | Power Supply | Negative power supply. It is normally tied to GND. It can also be tied to a voltage other than GND when the voltage between $+V_S$ and $-V_S$ is from 1.8 V to 5.5 V. If it is not connected to GND, bypass it with a capacitor of 0.1 μF to the part as close as possible. |
| 12 | +In D | I | Non-inverting input of the amplifier. |
| 13 | −In D | I | Inverting input of the amplifier. |
| 14 | Out D | O | Output of the amplifier. The voltage range extends to within millivolts of each supply rail. |

# Specifications

## Absolute Maximum Ratings (1)

| Parameter | | Min | Max | Unit |
|---|---|---|---|---|
| | Supply Voltage | | 6 | V |
| | Input Voltage | $(-V_S) - 0.2$ | $(+V_S) + 0.2$ | V |
| | Input Current: +IN, −IN (2) | −20 | 20 | mA |
| | Output Short-Circuit Duration (3) | | Indefinite | |
| | Current at Supply Pins | −50 | 50 | mA |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_A$ | Operating Temperature Range | −40 | 125 | °C |
| $T_{STG}$ | Storage Temperature Range | −65 | 150 | °C |
| $T_L$ | Lead Temperature (Soldering, 10 sec) | | 260 | °C |

(1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.
(2) The inputs are protected by ESD protection diodes to each power supply. If the input extends more than 500 mV beyond the power supply, the input current should be limited to less than 10 mA.
(3) A heat sink may be required to keep the junction temperature below the absolute maximum. This depends on the power supply voltage and how many amplifiers are shorted. The thermal resistance varies with the amount of PC board metal connected to the package. The specified values are for short traces connected to the leads.

## ESD, Electrostatic Discharge Protection

| Symbol | Parameter | Condition | Minimum Level | Unit |
|---|---|---|---|---|
| HBM | Human Body Model ESD | ANSI/ESDA/JEDEC JS-001 (1) | 7 | kV |
| CDM | Charged Device Model ESD | ANSI/ESDA/JEDEC JS-002 (2) | 2 | kV |

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

## Thermal Information

| Package Type | $\theta_{JA}$ | $\theta_{JC}$ | Unit |
|---|---|---|---|
| SOT353 (SC70-5) | 250 | | °C/W |
| SOT23-5 | 200 | | °C/W |
| MSOP8 | 210 | | °C/W |
| SOP8 | 158 | | °C/W |
| SOP14 | 83 | | °C/W |
| TSSOP14 | 100 | | °C/W |

## Electrical Characteristics

All test conditions: $V_S$ = 5 V, $T_A$ = 27°C, $R_L$ = 10 kΩ, $V_{CM}$ = $V_{DD}$ / 2, unless otherwise noted.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Supply Voltage Range | | 1.8 | | 5.5 | V |
| $I_Q$ | Quiescent Current per Amplifier | SGM8061 | | 45 | 65 | μA |
| | | SGM8062/8064 | | 42 | 60 | μA |
| $V_{OS}$ | Input Offset Voltage | $V_{CM}$ = 2.5 V | −10 | 1 | 10 | μV |
| | | $V_{CM}$ = 0.05 V to 4.95 V | −20 | | 20 | μV |
| | | $V_S$ = 1.8 V, $V_{CM}$ = 0.9 V | −20 | | 20 | μV |
| $dV_{OS}/dT$ | $V_S$ Power Supply | | | 0.008 | 0.05 | μV/°C |
| PSRR | Power Supply Rejection Ratio | $V_S$ = 3 V to 5 V | 100 | 120 | | dB |
| $V_n$ | Input Voltage Noise | f = 0.01 Hz to 1 Hz | | 0.4 | | $\mu V_{PP}$ |
| | | f = 0.1 Hz to 10 Hz | | 1.1 | | $\mu V_{PP}$ |
| $e_n$ | Input Voltage Noise Density | f = 1 kHz | | 55 | | nV/√Hz |
| $C_{IN}$ | Input Capacitor | Differential mode | | 3 | | pF |
| | | Common mode | | 2 | | pF |
| $I_B$ | Input Bias Current | | | ±50 | | pA |
| | Over Temperature | | | ±800 | | pA |
| $I_{OS}$ | Input Offset Current | | | ±100 | | pA |
| $V_{CM}$ | Common-Mode Voltage Range | | $(-V_S)$ − 0.1 | | $(+V_S)$ + 0.1 | V |
| CMRR | Common-Mode Rejection Ratio | $V_{CM}$ = 0.5 V to 4.5 V | 100 | 120 | | dB |
| $V_O$ | Output Voltage Swing from Rail | $R_L$ = 10 kΩ | | 10 | 25 | mV |
| $I_{SC}$ | Short-Circuit Current | | | ±60 | | mA |
| GBWP | Unity Gain Bandwidth | $C_L$ = 100 pF | | 350 | | kHz |
| SR | Slew Rate | G = +1, $C_L$ = 100 pF | | 0.16 | | V/μs |
| $t_{OR}$ | Overload Recovery Time | G = −10 | | 60 | | μs |
| $t_S$ | Settling Time, 0.01% | $C_L$ = 100 pF, G = +1, 5-V step | | 40 | | μs |
| $A_{VOL}$ | Open-Loop Voltage Gain | $(-V_S)$ + 100 mV < $V_O$ < $(+V_S)$ − 100 mV, $R_L$ = 100 kΩ | 100 | 120 | | dB |

## Typical Performance Characteristics

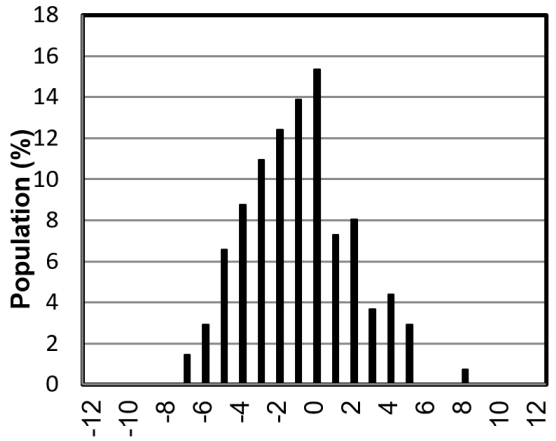



**Figure 1. Offset Voltage Distribution**

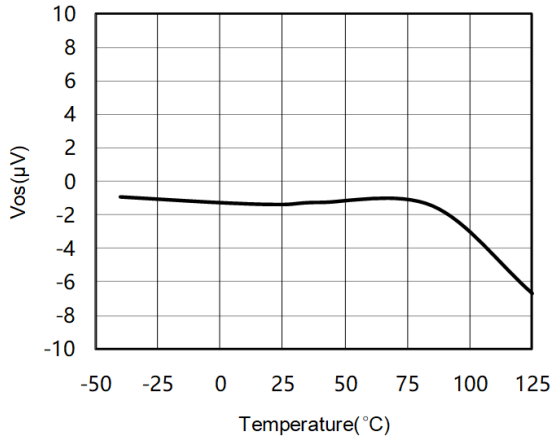



**Figure 2. Offset Voltage vs. Temperature**

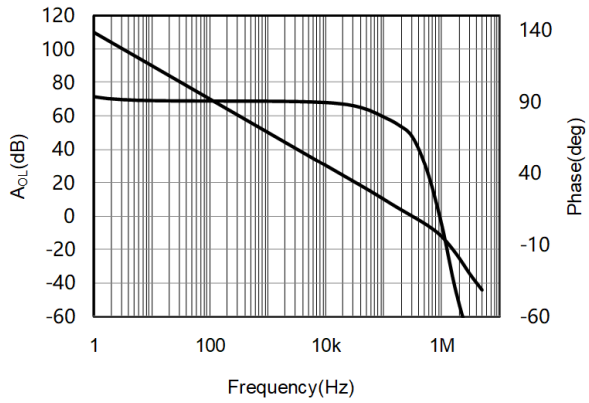



**Figure 3. Open-Loop Gain vs. Frequency**

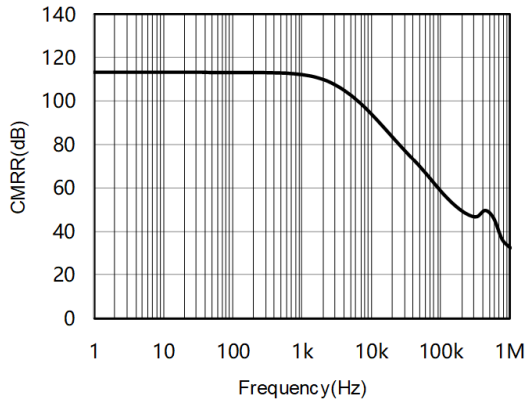



**Figure 4. CMRR vs. Frequency**

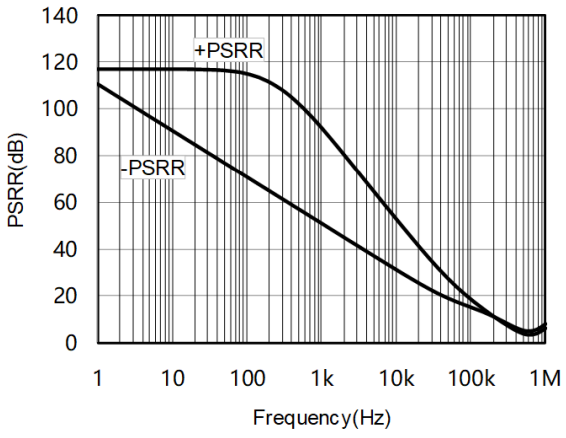



**Figure 5. PSRR vs. Frequency**

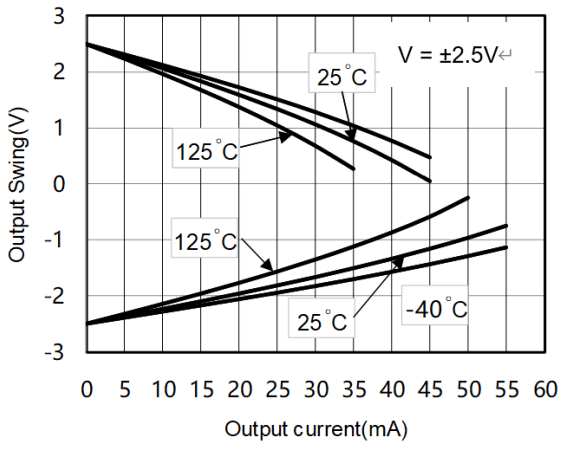



**Figure 6. Output Swing vs. Load Current**

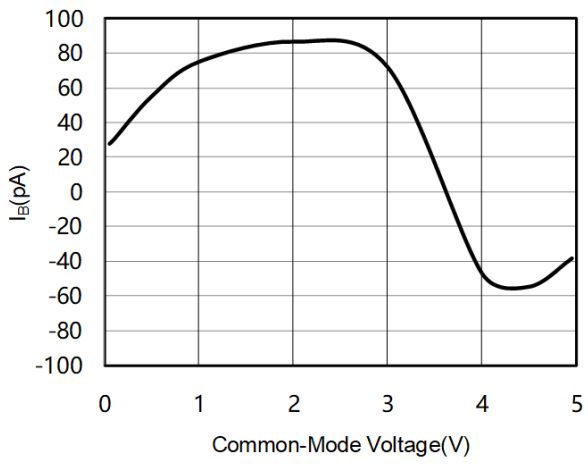



**Figure 7. $I_B$ vs. Common-Mode Voltage**

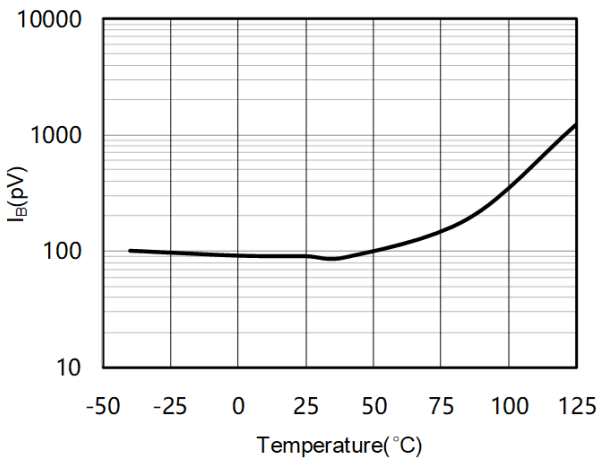



**Figure 8. Input Bias vs. Temperature**

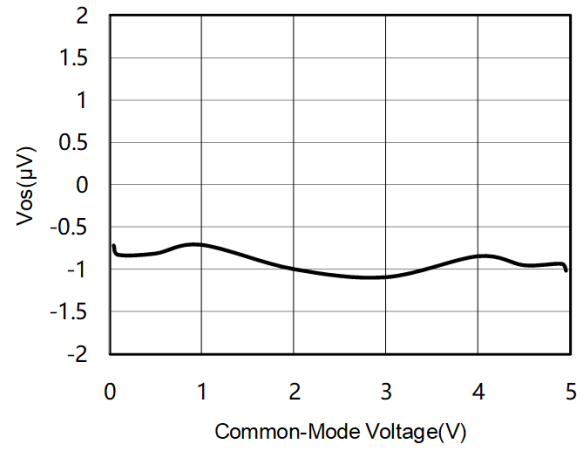



**Figure 9. $V_{OS}$ vs. Common-Mode Voltage**

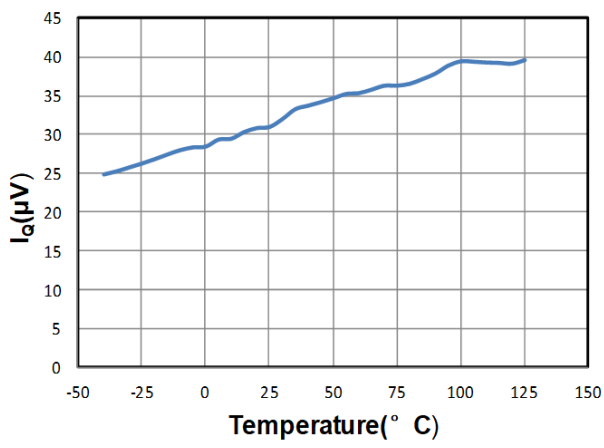



**Figure 10. Quiescent Current vs. Temperature**

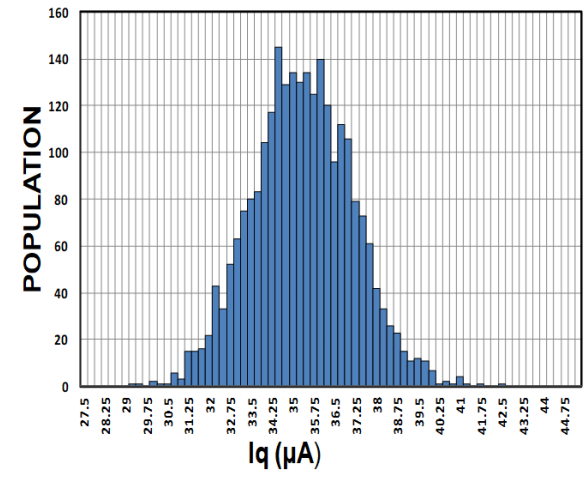



**Figure 11. Quiescent Current Distribution**

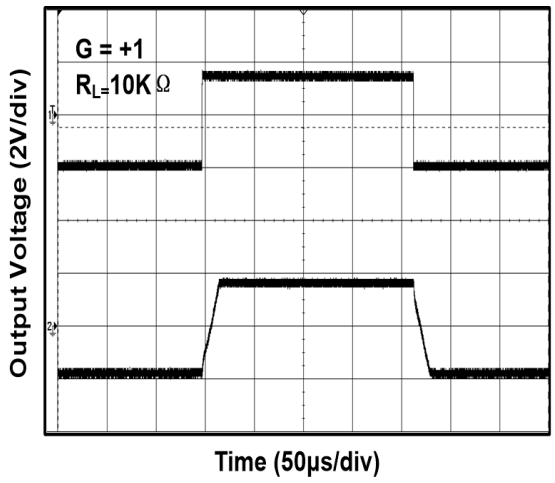



**Figure 12. Large-Scale Step Response**

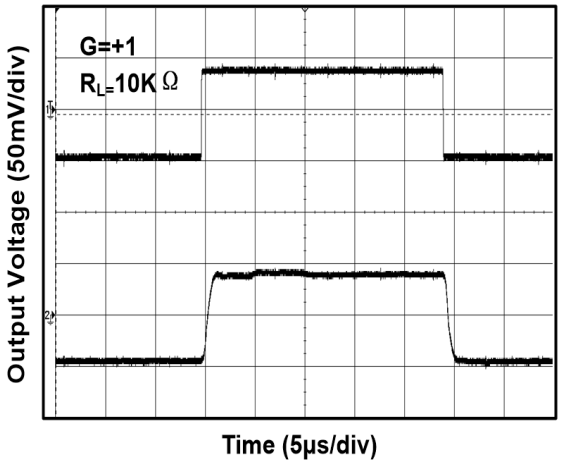



Figure 13. Small-Scale Step Response

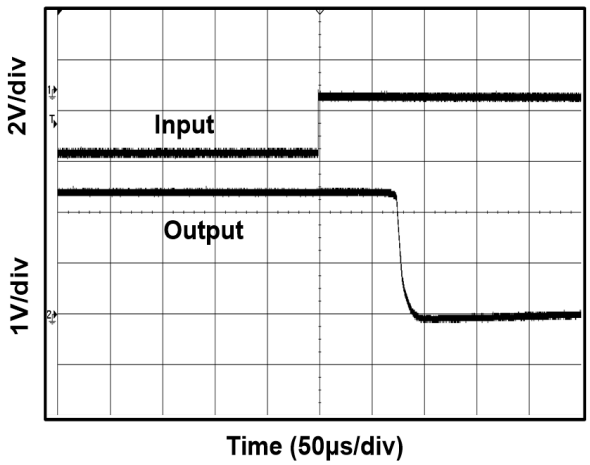



Figure 14. Positive Over-Voltage Recovery

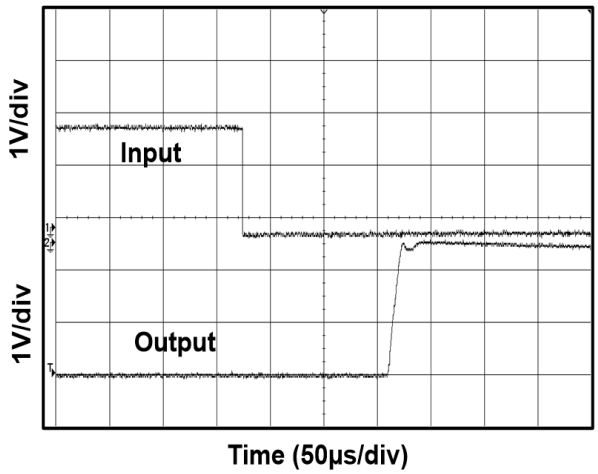



Figure 15. Negative Over-Voltage Recovery

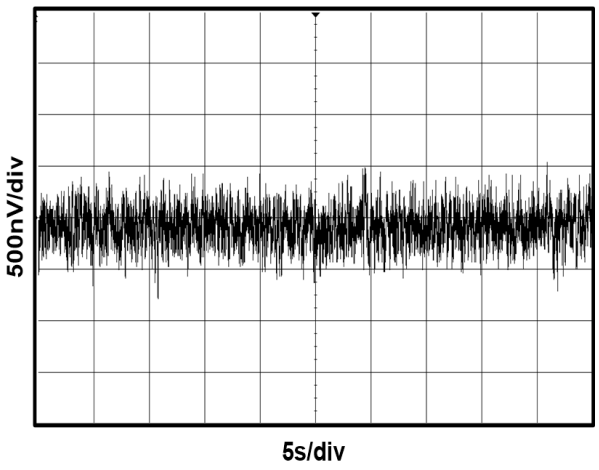



Figure 16. 0.1-Hz to 10-Hz Noise

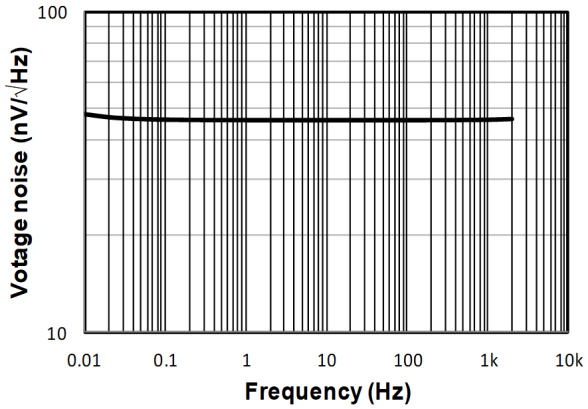



Figure 17. Voltage Noise Spectral Density vs. Frequency

## Application Information

### Rail-to-Rail Input and Output

The SGM806x series features rail-to-rail inputs and outputs with a supply voltage from 1.8 V to 5.5 V. This allows the inputs of the amplifier to have a wide common-mode range (50 mV beyond supply rails) while maintaining high CMRR (130 dB) and maximizes the signal-to-noise ratio of the amplifier by having the $V_{OH}$ and $V_{OL}$ levels at the $+V_S$ and $-V_S$ rails, respectively.

### Input Protection

The SGM806x series has internal ESD protection diodes that are connected between the inputs and supply rails. When either input exceeds one of the supply rails by more than 300 mV, the ESD diodes become forward-biased, and large amounts of current begin to flow through them. Without current limitation, this excessive fault current causes permanent damage to the device. Thus an external series resistor must be used to ensure that the input currents never exceed 10 mA.

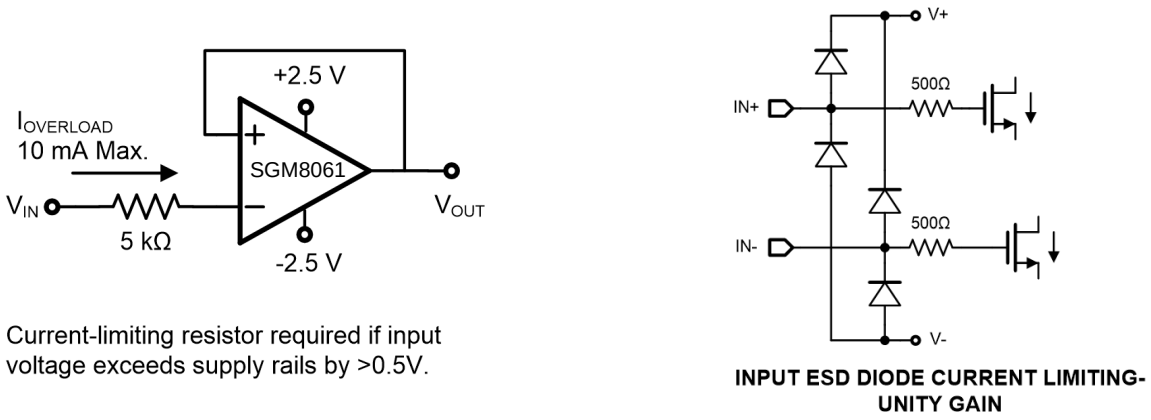



**Figure 18. Input Protection**

### Low Input Referred Noise

The flicker noise, as known as the 1/f noise, is inherent in semiconductor devices, and increases as the frequency decreases. So at lower frequencies, the flicker noise dominates, causing higher degrees of error for sub-Hertz frequencies or DC precision applications.

The SGM806x series is a chopper-stabilized amplifier, and the flicker noise is reduced greatly because of this technique. This reduction in the 1/f noise allows the SGM806x series to have much lower noise at DC and low frequency compared to standard low-noise amplifiers.

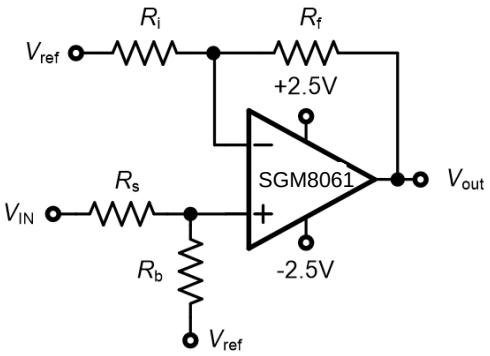



**Figure 19. Circuit Implication for Reducing Input Offset Current Effect**

**PCB Surface Leakage**

In applications where the low input bias current is critical, the Printed Circuit Board (PCB) surface leakage effects need to be considered. The surface leakage is caused by humidity, dust, or other contamination on the board. It is recommended to use the multi-layer PCB layout and route the −IN and +IN signal of the device under the PCB surface.

An effective way to reduce surface leakage is to use a guard ring around the sensitive pins (or traces). The guard ring is biased at the same voltage as the sensitive pin. An example of this type of layout is shown in Figure 20 for inverting gain applications.

1. For non-inverting gain and unity-gain buffers:
   a. Connect the non-inverting pin ($V_{+IN}$) to the input with a wire that does not touch the PCB surface.
   b. Connect the guard ring to the inverting input pin ($V_{-IN}$). This biases the guard ring to the common-mode input voltage.
2. For inverting gain and trans-impedance gain amplifiers (convert current to voltage, such as photo detectors):
   a. Connect the guard ring to the non-inverting input pin ($V_{+IN}$). This biases the guard ring to the same reference voltage as the operational amplifier (e.g., $V_{DD}$ / 2 or ground).
   b. Connect the inverting pin ($V_{-IN}$) to the input with a wire that does not touch the PCB surface.

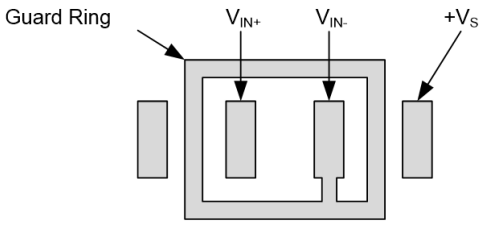



**Figure 20. The Layout of Guard Ring**

## Typical Application

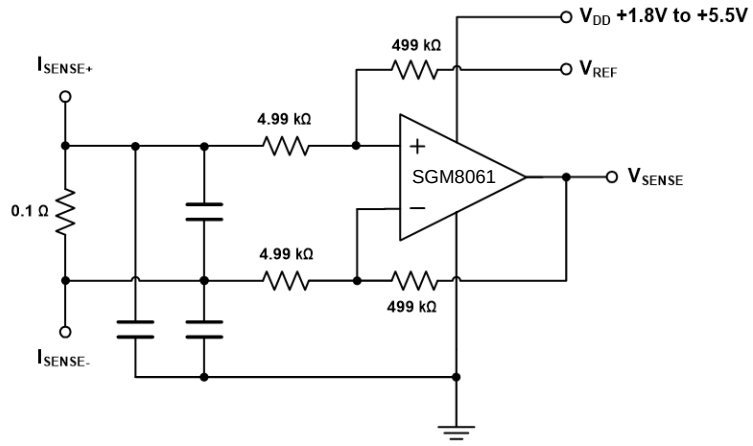



**Figure 21. Bi-Directional Current Sense Amplifier**

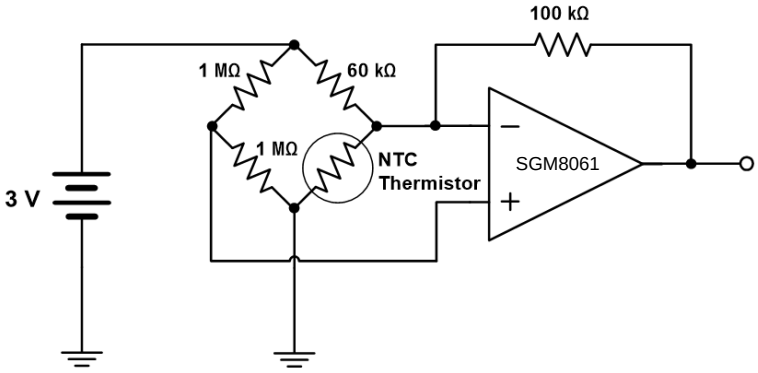
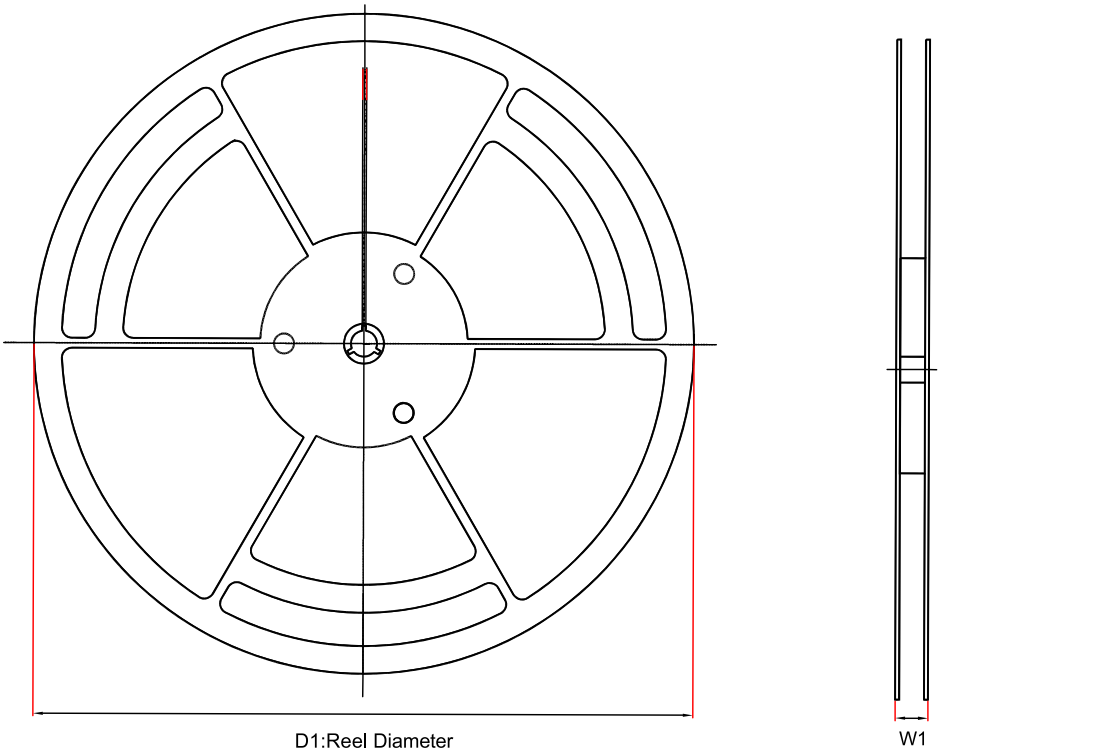



**Figure 22. Thermistor Measurement**

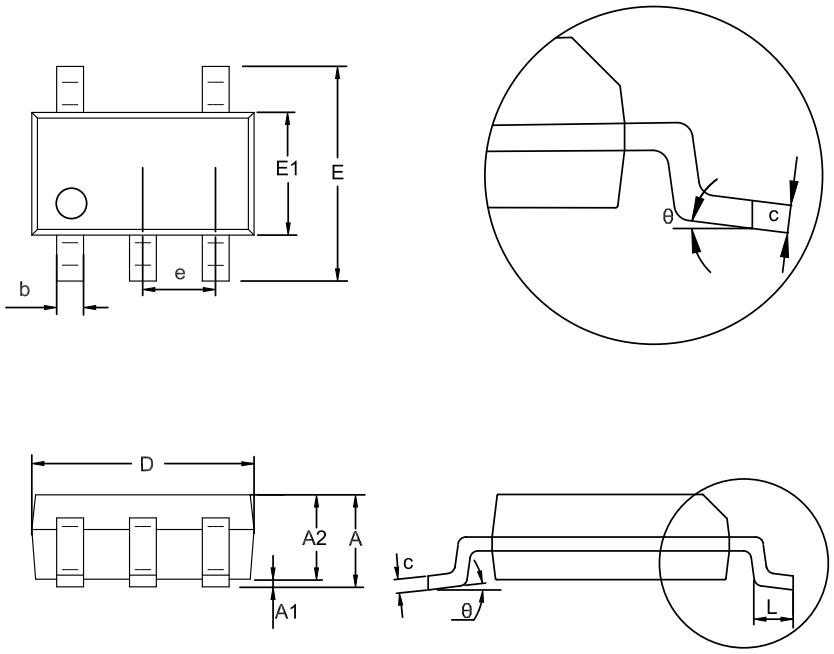
## Tape and Reel Information



## Package Outline Dimensions

### SOT23-5

Package Outline Dimensions S5T(SOT23-5-A)



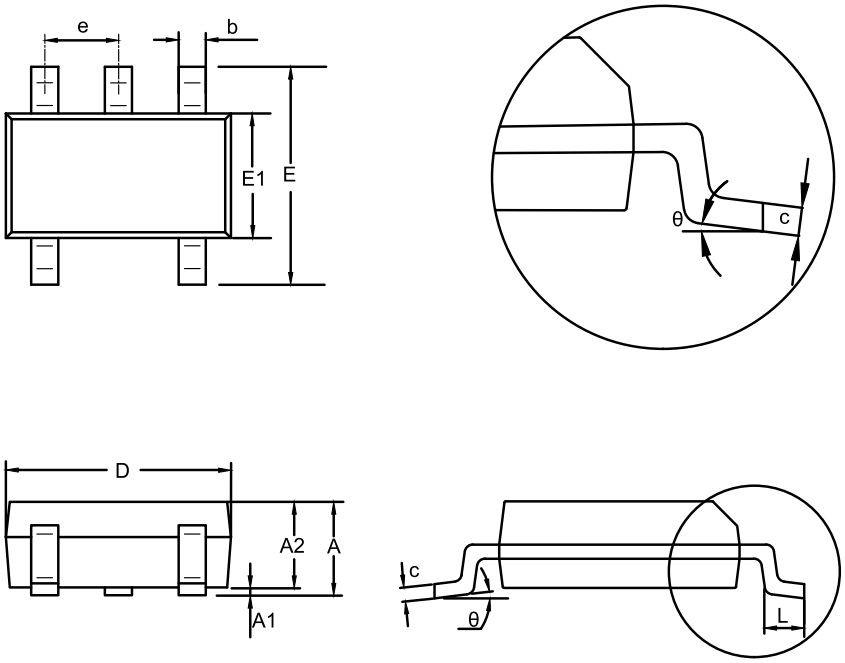

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.150 | 0.000 | 0.006 |
| A2 | 1.000 | 1.200 | 0.039 | 0.047 |
| b | 0.280 | 0.500 | 0.011 | 0.020 |
| c | 0.100 | 0.230 | 0.004 | 0.009 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 2.600 | 3.000 | 0.102 | 0.118 |
| E1 | 1.500 | 1.720 | 0.059 | 0.068 |
| e | 0.950 BSC | | 0.037 BSC | |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0 | 8° | 0 | 8° |

NOTES

1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

**SOT353 (SC70-5)**

## Package Outline Dimensions SC5(SOT353-5-A)



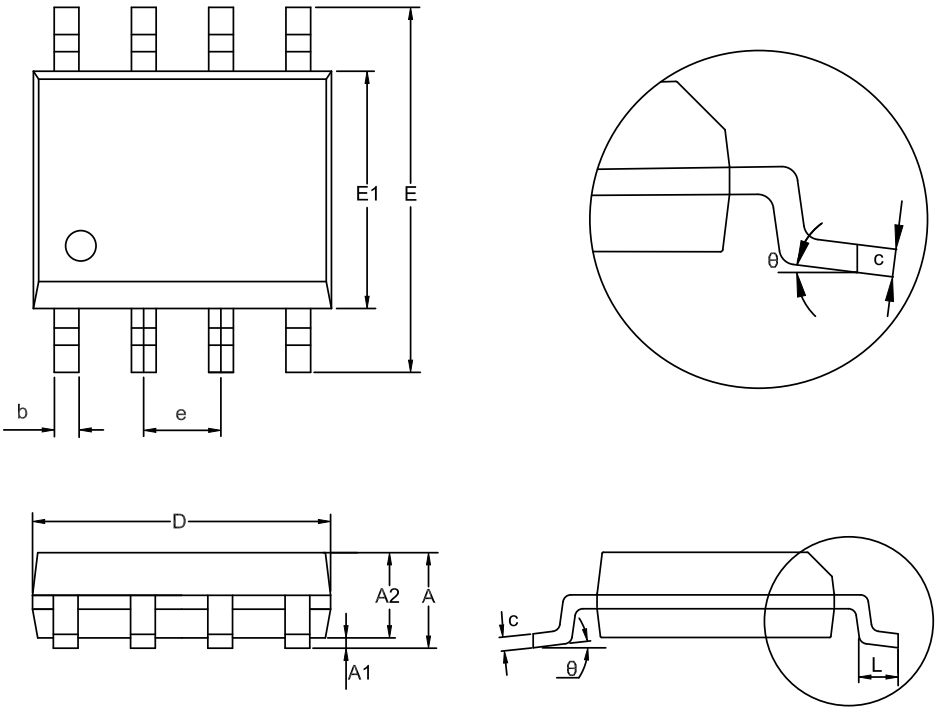

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.850 | 1.100 | 0.033 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.800 | 1.000 | 0.031 | 0.039 |
| b | 0.150 | 0.350 | 0.006 | 0.014 |
| c | 0.110 | 0.230 | 0.004 | 0.009 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 2.150 | 2.450 | 0.085 | 0.096 |
| E1 | 1.150 | 1.350 | 0.045 | 0.053 |
| e | 0.650 BSC | | 0.026 BSC | |
| L | 0.260 | 0.460 | 0.010 | 0.018 |
| θ | 0 | 8° | 0 | 8° |

NOTES

1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

**SOP8**

## Package Outline Dimensions SO1(SOP-8-A)



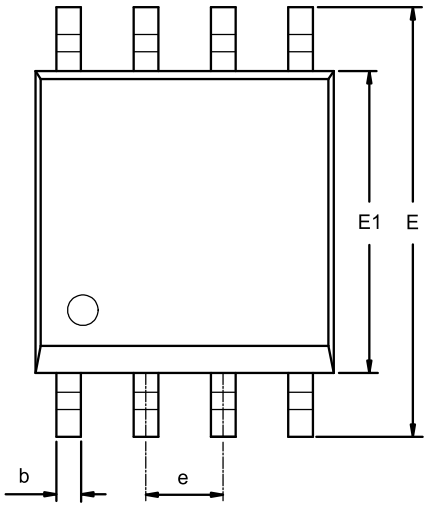

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.050 | 0.250 | 0.002 | 0.010 |
| A2 | 1.250 | 1.550 | 0.049 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.007 | 0.010 |
| D | 4.700 | 5.100 | 0.185 | 0.201 |
| E | 5.800 | 6.200 | 0.228 | 0.244 |
| E1 | 3.800 | 4.000 | 0.150 | 0.157 |
| e | 1.270 BSC | | 0.050 BSC | |
| L | 0.400 | 1.000 | 0.016 | 0.039 |
| θ | 0 | 8° | 0 | 8° |

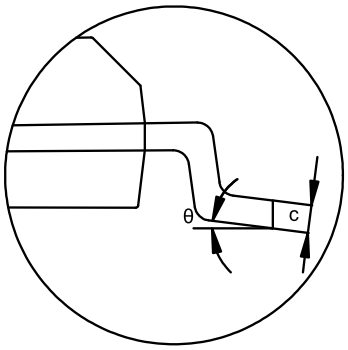
NOTES

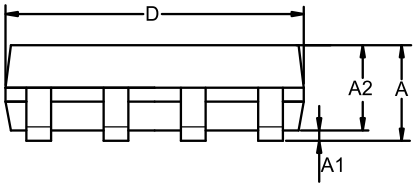
1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

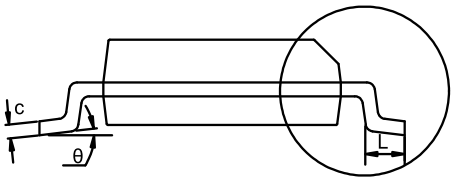
**MSOP8**

## Package Outline Dimensions VS1(MSOP-8-A)



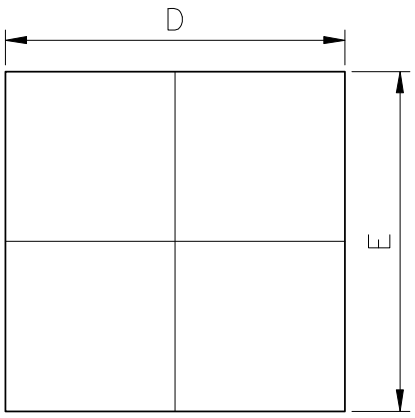

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.800 | 1.100 | 0.031 | 0.043 |
| A1 | 0.020 | 0.150 | 0.001 | 0.006 |
| A2 | 0.750 | 0.950 | 0.030 | 0.037 |
| b | 0.250 | 0.380 | 0.010 | 0.015 |
| c | 0.090 | 0.230 | 0.004 | 0.009 |
| D | 2.900 | 3.100 | 0.114 | 0.122 |
| E | 4.700 | 5.100 | 0.185 | 0.201 |
| E1 | 2.900 | 3.100 | 0.114 | 0.122 |
| e | 0.650 BSC | | 0.026 BSC | |
| L | 0.400 | 0.800 | 0.016 | 0.031 |
| θ | 0 | 8° | 0 | 8° |

NOTES

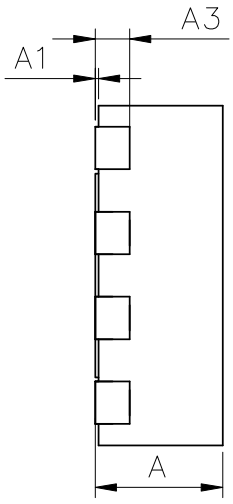
1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

**DFN2X2-8**

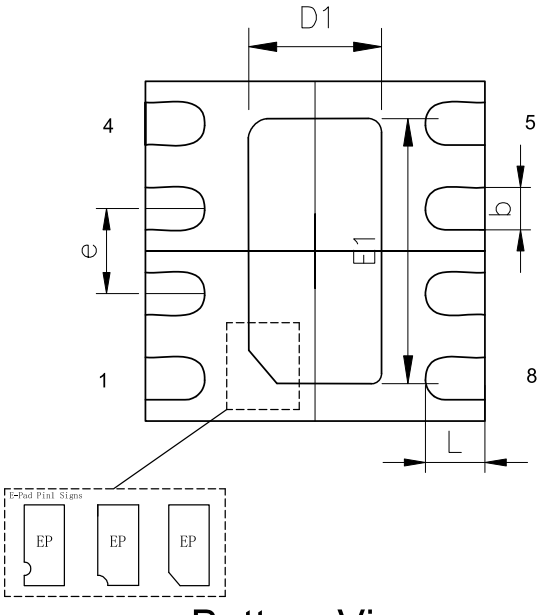
## Package Outline Dimensions DFG(DFN2X2-8-E)




Top View




Side View




Bottom View

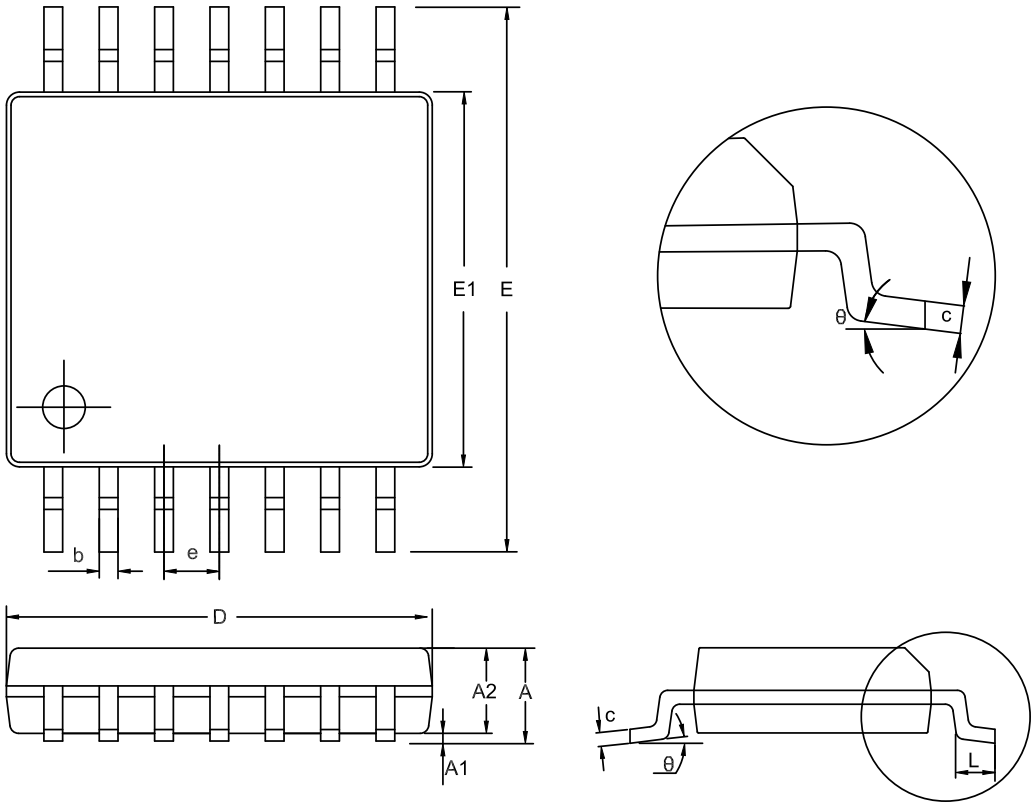
NOTES

1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.
3. The many types of E-pad Pin1 signs may appear in the product.

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.500 | 0.600 | 0.020 | 0.024 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| b | 0.150 | 0.300 | 0.006 | 0.012 |
| A3 | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 1.900 | 2.100 | 0.075 | 0.083 |
| D1 | 0.800 | 1.000 | 0.031 | 0.039 |
| E | 1.900 | 2.100 | 0.075 | 0.083 |
| E1 | 1.600 | 1.800 | 0.063 | 0.071 |
| e | 0.500 BSC | | 0.020BSC | |
| L | 0.224 | 0.376 | 0.009 | 0.015 |

**TSSOP14**

## Package Outline Dimensions TS2(TSSOP-14-A)



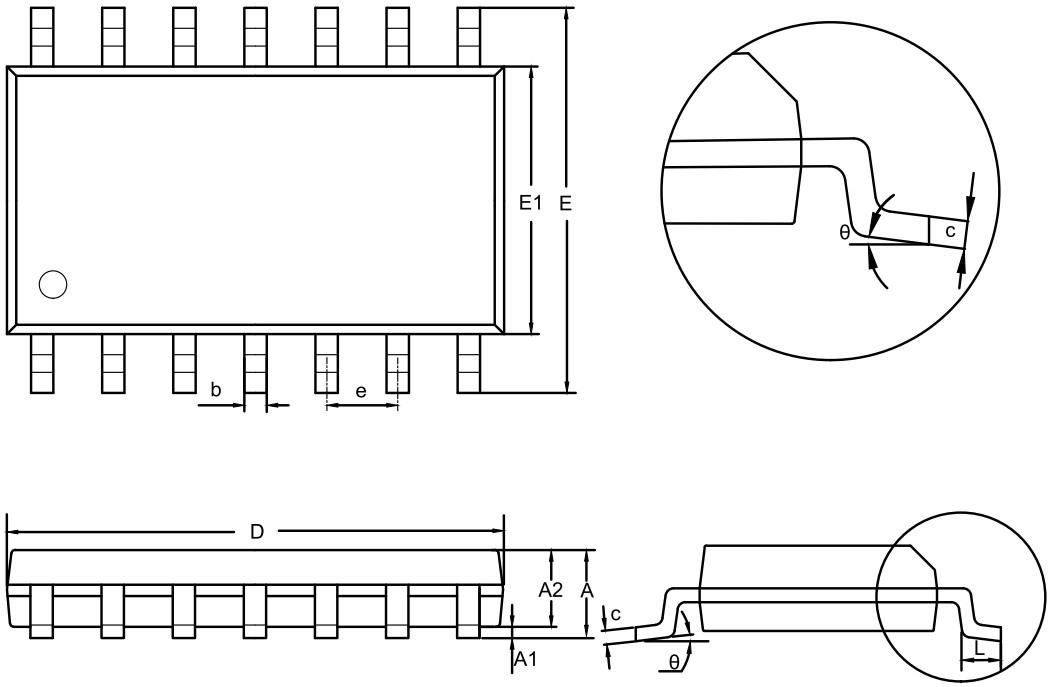

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 0.900 | 1.200 | 0.035 | 0.047 |
| A1 | 0.050 | 0.150 | 0.002 | 0.006 |
| A2 | 0.800 | 1.050 | 0.031 | 0.041 |
| b | 0.190 | 0.300 | 0.007 | 0.012 |
| c | 0.090 | 0.200 | 0.004 | 0.008 |
| D | 4.900 | 5.100 | 0.193 | 0.201 |
| E | 6.200 | 6.600 | 0.244 | 0.260 |
| E1 | 4.300 | 4.500 | 0.169 | 0.177 |
| e | 0.650 BSC | | 0.026 BSC | |
| L | 0.450 | 0.750 | 0.018 | 0.030 |
| θ | 0 | 8° | 0 | 8° |

NOTES

1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

**SOP14**

## Package Outline Dimensions SO2(SOP-14-A)




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.050 | 0.250 | 0.002 | 0.010 |
| A2 | 1.250 | 1.650 | 0.049 | 0.065 |
| b | 0.310 | 0.510 | 0.012 | 0.020 |
| c | 0.100 | 0.250 | 0.004 | 0.010 |
| D | 8.450 | 8.850 | 0.333 | 0.348 |
| E | 5.800 | 6.200 | 0.228 | 0.244 |
| E1 | 3.800 | 4.000 | 0.150 | 0.157 |
| e | 1.270 BSC | | 0.050 BSC | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0 | 8° | 0 | 8° |

NOTES

1. Do not include mold flash or protrusion.
2. This drawing is subject to change without notice.

## Order Information

| Order Number | Operating Temperature Range | Package | Marking Information | MSL | Transport Media, Quantity | Eco Plan |
|---|---|---|---|---|---|---|
| SGM8061XN5 | −40 to 125°C | SOT23-5 | E31T | 3 | Tape and Reel, 3,000 | Green |
| SGM8061U | −40 to 125°C | SOT23-5 | E31U | 3 | Tape and Reel, 3,000 | Green |
| SGM8061U-C | −40 to 125°C | SOT353 (SC70-5) | 31V | 3 | Tape and Reel, 3,000 | Green |
| SGM8062AR | −40 to 125°C | SOP8 | SGM8062 | 3 | Tape and Reel, 4,000 | Green |
| SGM8062BR | −40 to 125°C | DFN2X2-8 | 8062 | 3 | Tape and Reel, 3,000 | Green |
| SGM8062CR | −40 to 125°C | MSOP8 | SGM8062 | 3 | Tape and Reel, 3,000 | Green |
| SGM8064A | −40 to 125°C | SOP14 | SGM8064 | 3 | Tape and Reel, 2,500 | Green |
| SGM8064B | −40 to 125°C | TSSOP14 | SGM8064 | 3 | Tape and Reel, 3,000 | Green |