# SHC6248B 24Bit 2-kSPS, Analog-To-Digital Converters With Programmable Gain Amplifier (PGA) For Sensor Measurement

## 1 Features

- Programmable Data Rates Up to 2 kSPS
- Analog Multiplexer With 8 Independently Selectable Inputs
- Single-Cycle Settling for All Data Rates
- Low-Noise PGA 1~128V/V
- Dual 0.1% Matched Programmable Excitation Current Sources
- Internal Reference: 8ppm/°C & 0.05% accuracy
- Simultaneous 50Hz and 60Hz Rejection at 5/10/20SPS data rate
- Sensor Burn-Out Detection and bias generator
- 8 General-Purpose I/Os
- Internal Temperature Sensor
- Analog Supply: Unipolar (2.7 V to 5.25 V) and Bipolar (±2.5 V) Operation
- Digital Supply: 2.7 V to 5.25 V

## 2 Applications

- Temperature Sensor Measurements:
  - RTDs, Thermocouples, and Thermistors
- Pressure Measurements
- Factory Automation and Process Controls
- Instrumentation

## 3 Description

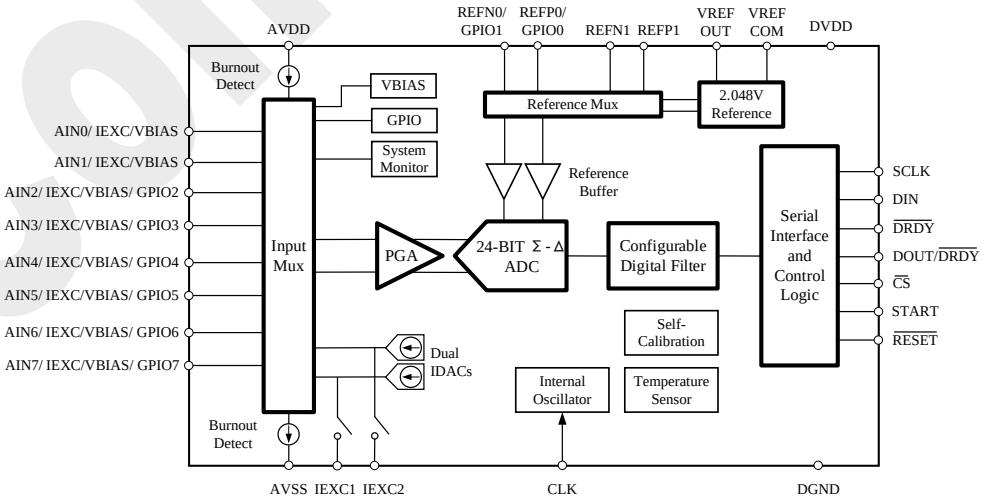
The SHC6248B device is a precision, 24-bit analog-to-digital converter (ADC) that include many integrated features to reduce system cost and component count for sensor measurement applications. The device features a low-noise, programmable gain amplifier (PGA), a precision delta-sigma (ΔΣ) ADC with a single-cycle settling digital filter, and an internal oscillator. The SHC6248B device also provide a built-in, low-drift voltage reference, and two matched programmable excitation current sources (IDACs). An input multiplexer supports four differential inputs. In addition, the multiplexer integrates sensor burn-out detection, voltage bias for thermocouples, system monitoring, and general purpose digital I/Os. The PGA provides selectable gains up to 128 V/V. These features provide a complete front-end solution for temperature sensor measurement applications including thermocouples, thermistors, and resistance temperature detectors (RTDs) and other small signal measurements including resistive bridge sensors.

The digital filter settles in a single cycle to support fast channel cycling when using the input multiplexer and provides data rates up to 2 kSPS. For certain data rates, both 50Hz and 60Hz interference are rejected by the filter.

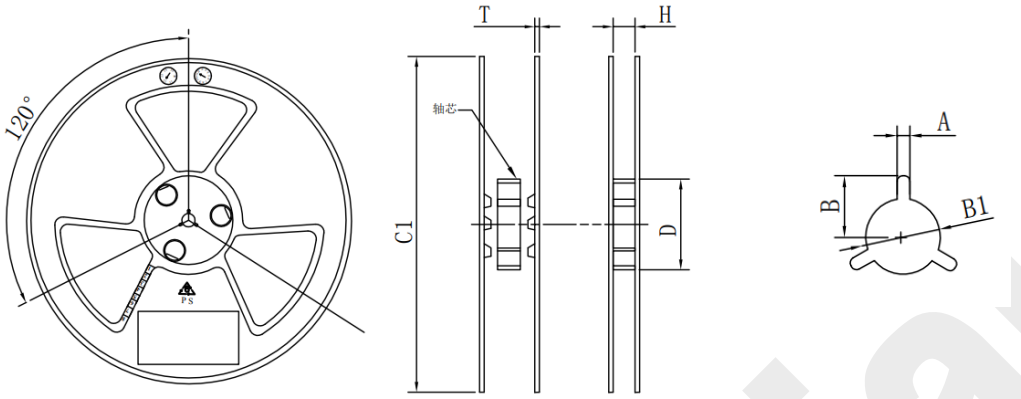
**Device Information**

| DEVICE NAME | PACKAGE (PIN) | BODY SIZE |
|---|---|---|
| SHC6248B | TSSOP (28) | 9.70 mm × 4.40 mm |

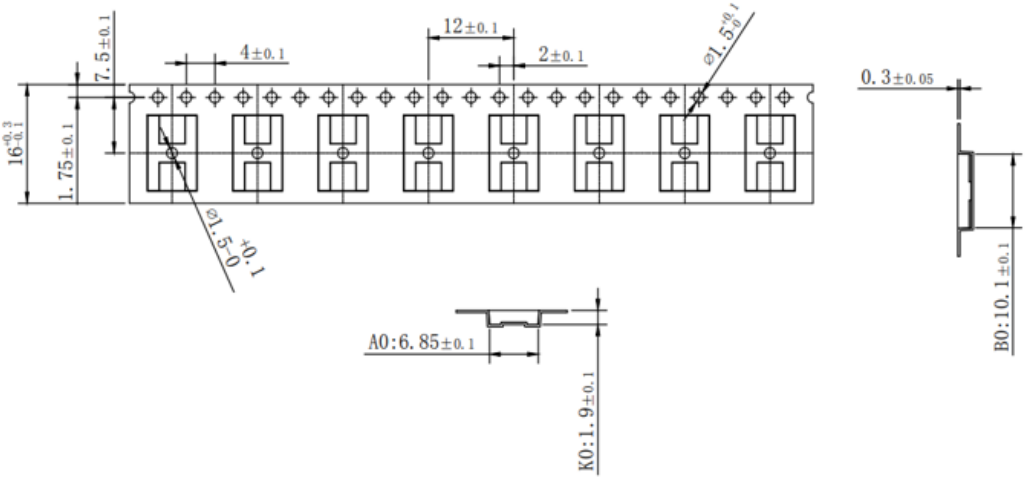
## 4 Simplified Schematics

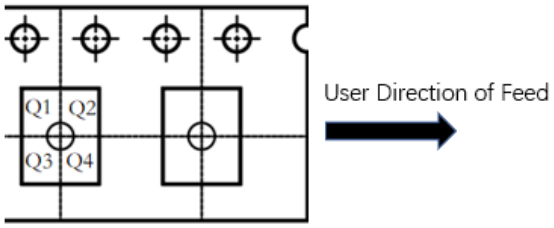


## 10.7 Tape and Reel Information




| | | |
|---|---|---|
| C1 | 330±3 | 178±3 |
| H | 16.5±0.5 | 16.8±0.5 |
| A | 2.3±0.3 | 2.6±0.3 |
| B | 10.75±0.3 | 22.5±0.3 |
| B1 | ∅13.0 +0.5/–0.2 | ∅13.5±0.3 |
| T | 2±0.2 | 1.2±0.2 |
| D | ∅100±1 | ∅60±0.5 |
| SPQ | 2000 | 300 |
| Pin1 Quadrant | Q1 | Q1 |

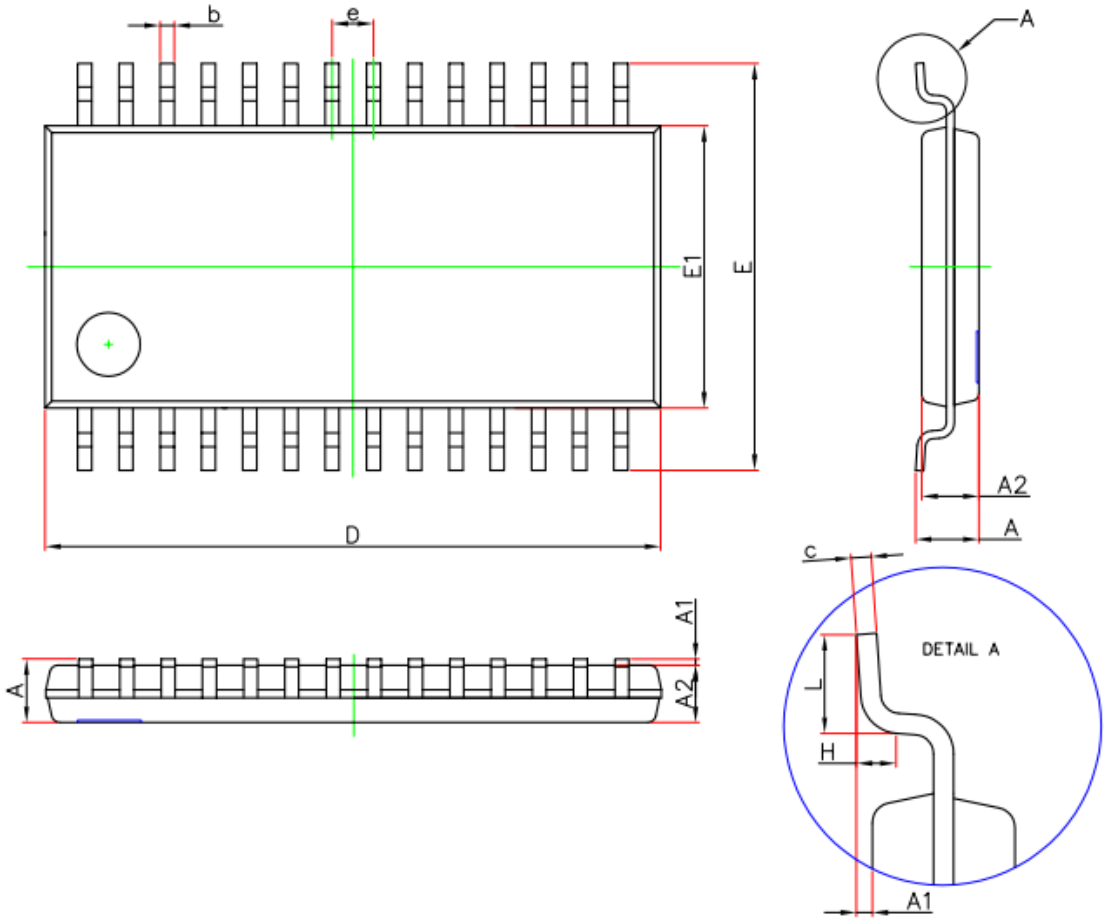



Note: Q1~Q4 is Pocket Quadrants

### 10.8 Package Information

TSSOP28 PACKAGE OUTLINE DIMENSIONS




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | — | 1.200 | — | 0.047 |
| A1 | 0.050 | 0.150 | 0.002 | 0.006 |
| A2 | 0.800 | 1.000 | 0.031 | 0.039 |
| b | 0.190 | 0.300 | 0.007 | 0.012 |
| c | 0.090 | 0.200 | 0.004 | 0.008 |
| D | 9.600 | 9.800 | 0.378 | 0.386 |
| E | 6.250 | 6.550 | 0.246 | 0.258 |
| E1 | 4.300 | 4.500 | 0.169 | 0.177 |
| e | 0.650(BSC) | | 0.026(BSC) | |
| L | 0.500 | 0.700 | 0.020 | 0.028 |
| H | 0.250(TYP) | | 0.010(TYP) | |

## 10.9 Ordering Guide

| Orderable Device | Package | Package Qty | MSL-Peak-Temp | Lead Fish Plating | Op Temp (°C) | RoHS (Pb Free) |
|---|---|---|---|---|---|---|
| SHC6248BTSPIR | TSSOP-28 | 2000 | Level 2-260°C | 100%Sn | -40 to 125°C | Yes |
| SHC6248BTSPIT | TSSOP-28 | 300 | Level 2-260°C | 100%Sn | -40 to 125°C | Yes |