

SHC6148 16Bit 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
- 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

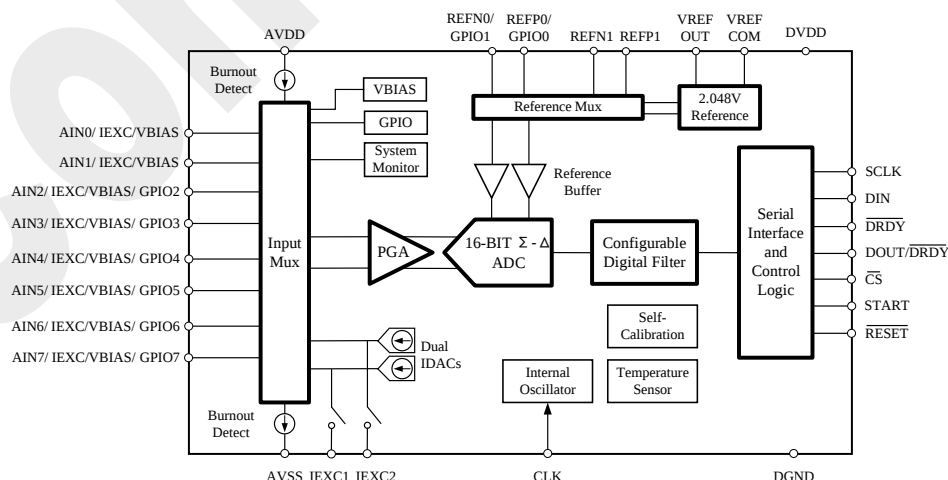
The SHC6148 device is a precision, 16-bit analog-to-digital converter (ADC) that include many integrated features to reduce system cost and component count for sensor measurement applications. The device features a low-noise, programmable gain amplifier (PGA), a precision delta-sigma ($\Delta\Sigma$) ADC with a single-cycle settling digital filter, and an internal oscillator. The SHC6148 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.

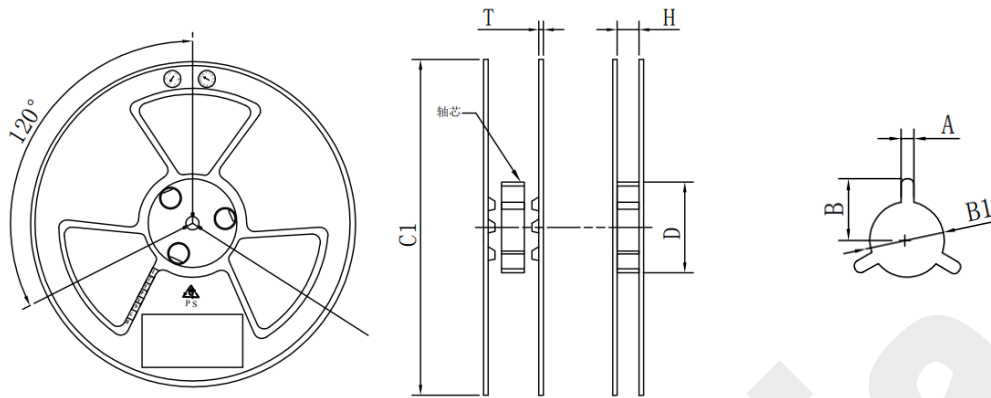
Device Information

DEVICE NAME	PACKAGE (PIN)	BODY SIZE
SHC6148	TSSOP (28)	9.70 mm × 4.40 mm

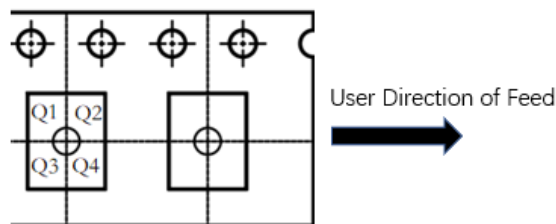
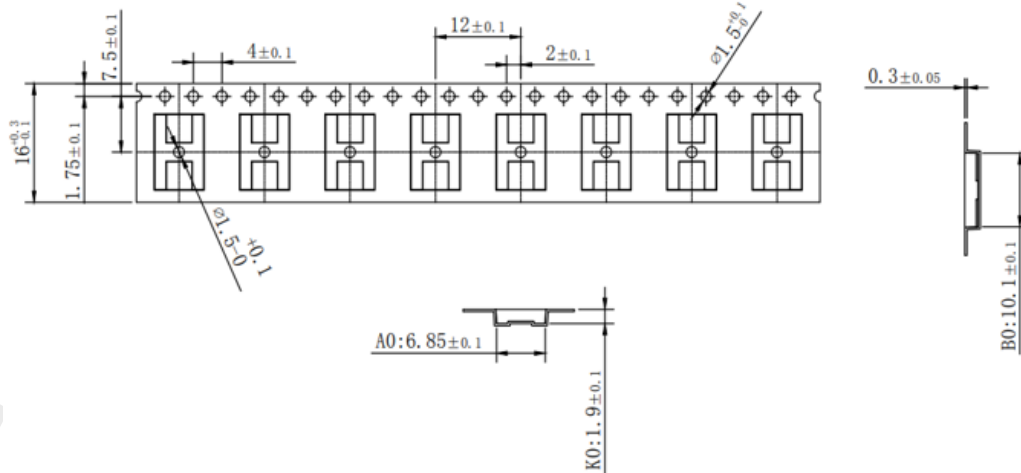
4 Simplified Schematics



10.7 Tape and Reel Information



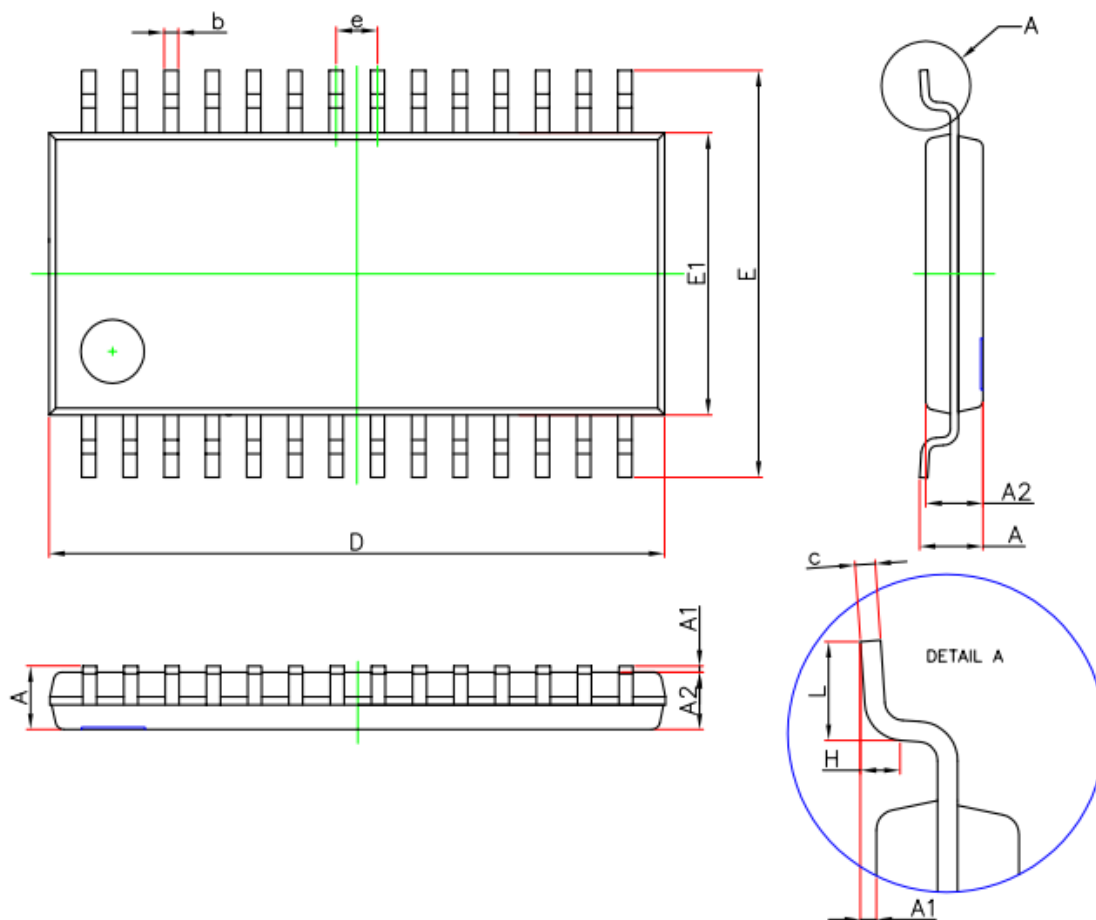
C1	330±3	178±3
H	16.5±0.5	16.8±0.5
A	2.3±0.3	2.6±0.3
B	10.75±0.3	22.5±0.3
B1	Ø13.0+0.5/-0.2	Ø13.5±0.3
T	2±0.2	1.2±0.2
D	Ø100±1	Ø60±0.5
SPQ	2000	300
Pin1 Quadrant	Q1	Q1



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)
SHC6148TSPiR	TSSOP-28	2000	Level 2-260°C	100%Sn	-40 to 125°C	Yes
SHC6148TSPiT	TSSOP-28	300	Level 2-260°C	100%Sn	-40 to 125°C	Yes