ADI AD7879 12 位 SAR ADC 评估方案

ADI 公司的 AD7879/AD7889 是带同步串行接口和低导通电阻开关的 12 位 SAR ADC,可以驱动 4 线电阻型触摸屏.单电源 1.6V-3.6V 工作,吞吐量速率高达 105kSPS.主要用于 PDA,智能手持设备,触摸屏监视器,POS 终端,医疗设备和手机.本文介绍 AD7879/AD7889 主要特性, 功能方框图, 模拟输入架构框图, 典型应用电路图和 AD7879 评估板主要特性与电路图.

The AD7879/AD7889 are 12-bit successive approximation analog-to-digital converters (SAR ADCs) with a synchronous serial interface and low on-resistance switches for driving 4-wire resistive touch screens. The AD7879/AD7889 work with a very low power supply—a single 1.6 V to 3.6 V supply—and feature throughput rates of 105 kSPS. The devices include a shutdown mode that reduces current consumption to less than 6 μA. To reduce the effects of noise from LCDs and other sources, the AD7879/AD7889 contain a preprocessing block. The preprocessing function consists of a median filter and an averaging filter.

The combination of these two filters provides a more robust solution, discarding the spurious noise in the signal and keeping only the data of interest. The size of both filters is programmable. Other user-programmable conversion controls include variable acquisition time and first conversion delay; up to 16 averages can be taken per conversion. The AD7879/AD7889 can run in slave mode or standalone (master) mode, using an automatic conversion sequencer and timer. The AD7879/AD7889 have a programmable pin that can operate as an auxiliary input to the ADC, as a battery monitor, or as a GPIO. In addition, a programmable interrupt output can operate in three modes: as a general-purpose interrupt to signal when new data is available (DAV), as an interrupt to indicate when limits are exceeded (INT), or as a pen-down interrupt when the screen is touched (PENIRQ).

The AD7879/AD7889 offer temp- erature measurement and touch-pressure measurement. The AD7879 is available in a 12-ball, 1.6 mm × 2 mm WLCSP and in a 16-lead, 4 mm × 4 mm LFCSP. The AD7889 is available in a backside-coated version of the WLCSP. Both parts support an SPI interface (AD7879/AD7889) or an I2C® interface (AD7879-1/AD7889-1).

AD7879 主要特性:

4-wire touch screen interface

1.6 V to 3.6 V operation

Median and averaging filter to reduce noise

Automatic conversion sequencer and timer

User-programmable conversion parameters

Auxiliary analog input/battery monitor (0.5V to 5V)

1 optional GPIO

Interrupt outputs (INT, PENIRQ)

Touch-pressure measurement

Wake-up on touch function

Shutdown mode: 6 μA maximum

12-ball, 1.6 mm × 2 mm WLCSP

16-lead, 4 mm × 4 mm LFCSP

AD7879 应用:

Personal digital assistants

Smart handheld devices

Touch screen monitors
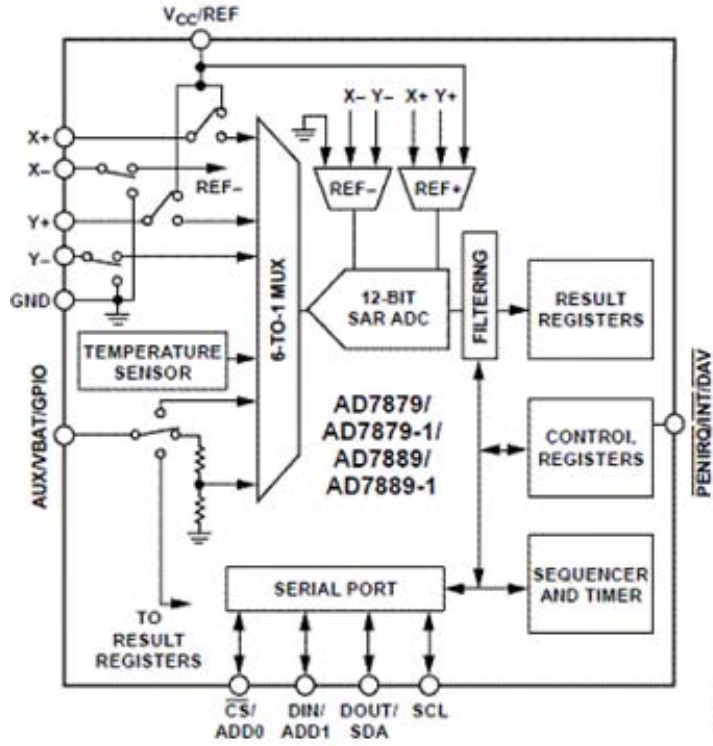
Point-of-sale terminals
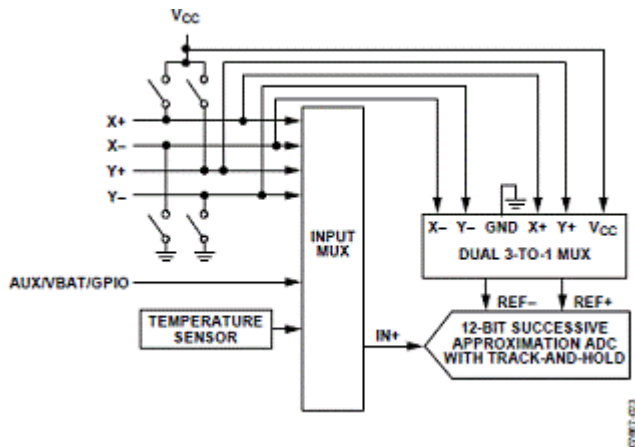
Medical devices

Cell phones
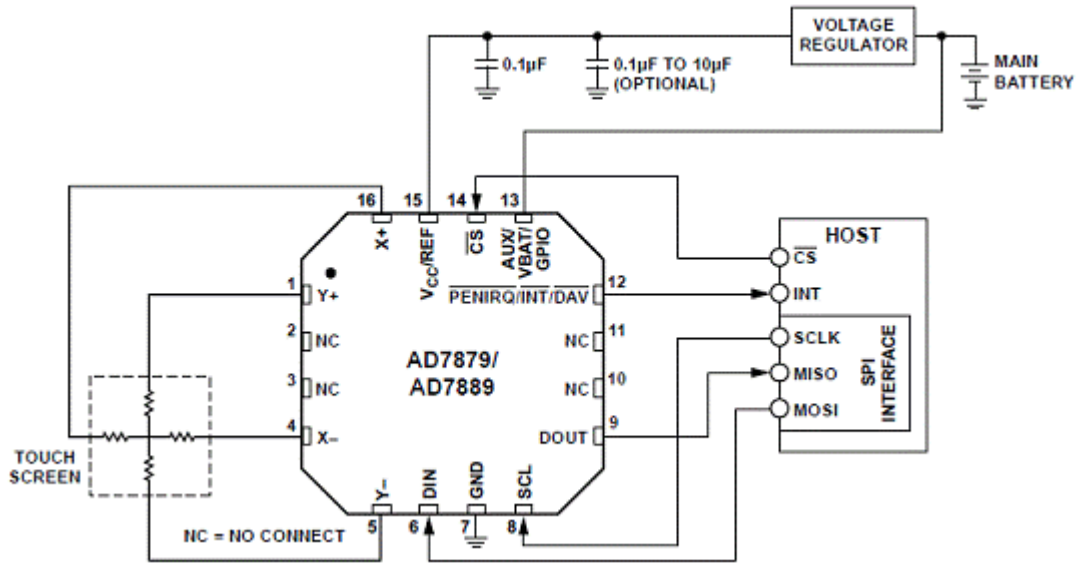
图 1.AD7879 功能方框图

图 2.AD7879 模拟输入架构框图

图 3.AD7879 典型应用电路图

AD7879 评估板

The AD7879/AD7879-1 evaluation board allows you to evaluate all features of the AD7879/AD7879-1. The evaluation software allows you to change the settings on the AD7879/AD7879-1. You can connect the touch screen to Connector J3 or use the on-board variable resistors to evaluate the touch screen function.

AD7879 评估板主要特性:

Easy access to the AD7879/AD7879-1

Connects to any PC USB port

Self-contained evaluation system

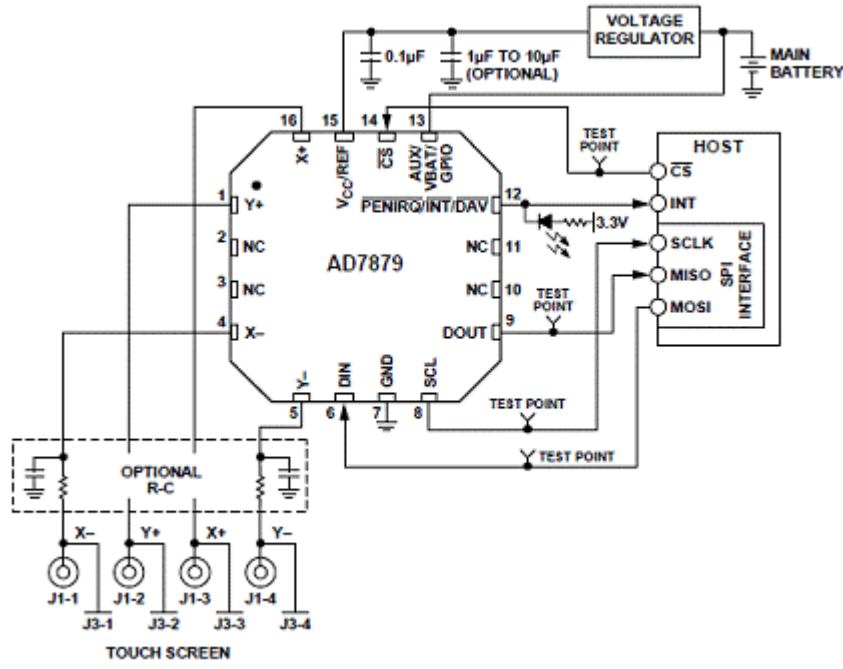Test points for easy access to signals

Touch screen included

图 4.AD7879 评估板方框图
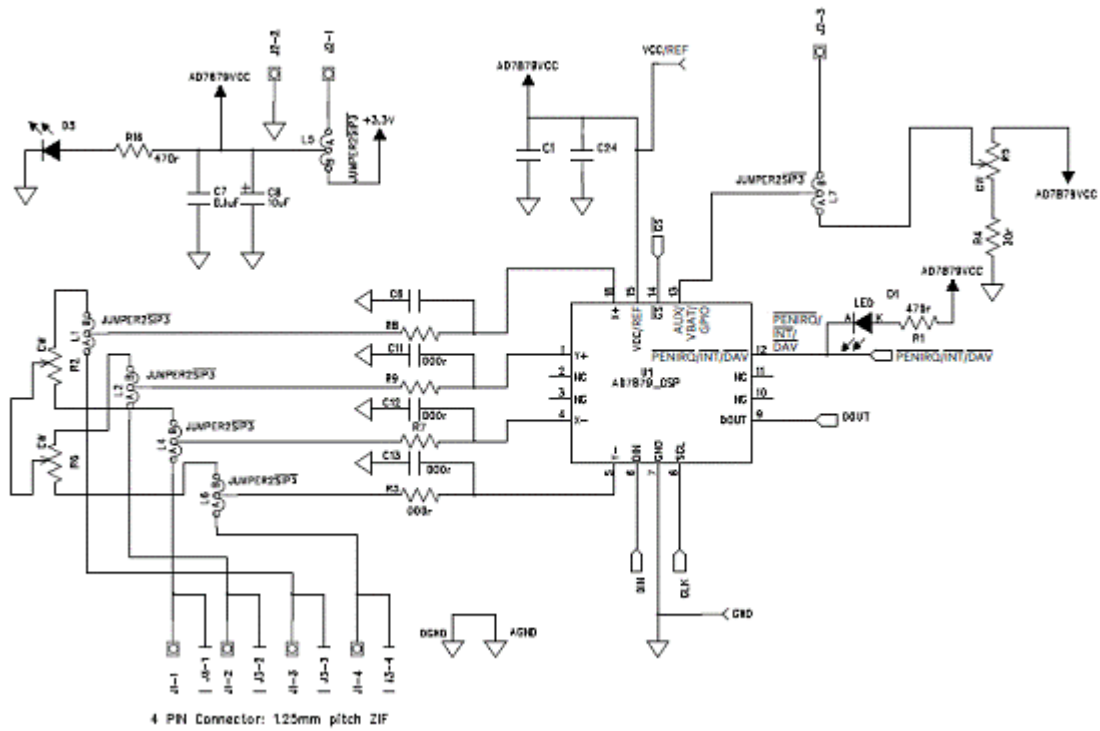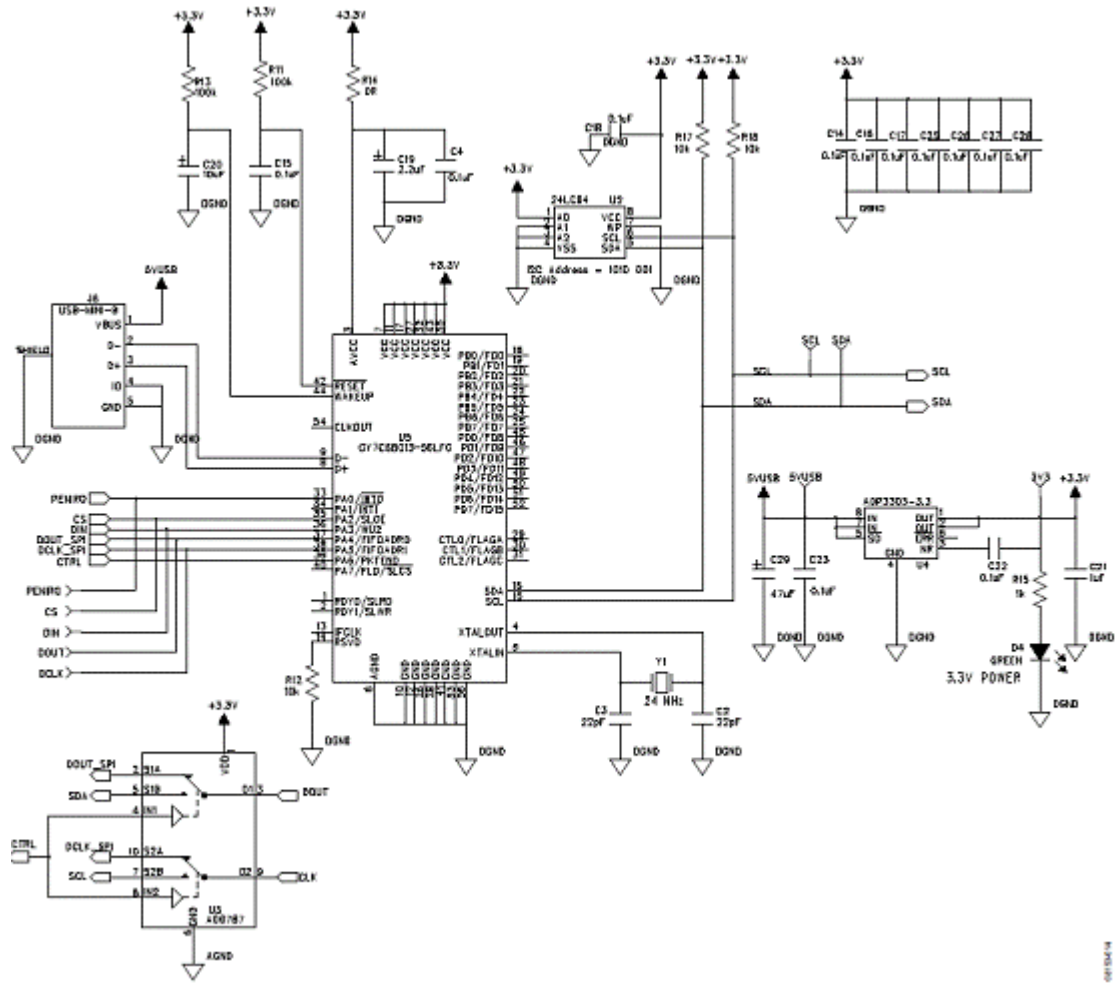

图 5.AD7879 评估板电路图: AD7879/AD7879-1 部分

图 6.AD7879/AD7879-1 评估板电路图:USB 部分