

TI ADS1298 8 路 24 位精度心电图(ECG)前端方案

TI 公司的 ADS1298 是集成了心电图(ECG)前端的 8 路 24 位精度 delta-sigma ($\Delta\Sigma$) 模/数转换器,具有同时取样和内置的可编增益放大器(PGA),基准电压和振荡器,包含了医疗心电图(ECG)和脑电图(EEG)所有的功能.本文介绍了 ADS1298 主要特性和优势,功能方框图,以及每路输入复接器方框图,单电源连接框图, 双电源连接框图与心电图(ECG)总体方框图.

8-Channel, 24-Bit Analog-To-Digital Converter With Integrated ECG Front End

The ADS1294/6/8 are a family of multichannel, simultaneous sampling, 24-bit, delta-sigma ($\Delta\Sigma$) analog-to-digital converters (ADCs) with a built-in programmable gain amplifier (PGA), internal reference, and an onboard oscillator. The ADS1294/6/8 incorporate all of the features that are commonly required in medical electrocardiogram (ECG) and electroencephalogram (EEG) applications.

ADS1298 主要特性和优势:

Simplifies design and saves board space, using up to 95 percent fewer components, by integrating all common features required for ECG and EEG front ends, including the following:

eight low-noise programmable gain amplifiers (PGAs).

eight high-resolution, simultaneous sampling analog-to-digital converters (ADCs).

integrated amplifier for right-leg drive.

integrated amplifiers for Wilson Central Terminal (WCT) and Goldberger Terminals (GCT).

digital pace detection capability.

continuous lead-off detection.

onboard oscillator and reference for smaller footprint and low-power applications.

Power consumption of 1 mW/channel results in up to 95 percent less power use than discrete implementations, increasing equipment portability and improving patient mobility.

The ADS1298's 4-uVpp (typical) input-referred noise is far superior to the limits set

in IEC60601-2-27/51, for more accurate measurements in portable equipment and high channel-density, high-end ECG and EEG equipment.

Complementing the analog front end's leading power consumption is the low-power TMS320C5505 DSP family. At less than 0.15-mW/MHz power consumption, the TMS320C5505 maximizes battery life for portable patient monitoring applications. Together with TI's full portfolio of analog signal chain and power management solutions, these devices offer customers a complete signal chain for ECG and EEG applications to speed their time to market.

ADS1298 应用:

- Medical Instrumentation (ECG and EEG) including:
 - Patient monitoring; Holter, event, stress, and vital signs ECG, AED, telemedicine, fetal ECG
 - Bispectral index (BIS), Evoked audio potential (EAP), Sleep study monitor
- High-Precision, Simultaneous, Multichannel Signal Acquisition

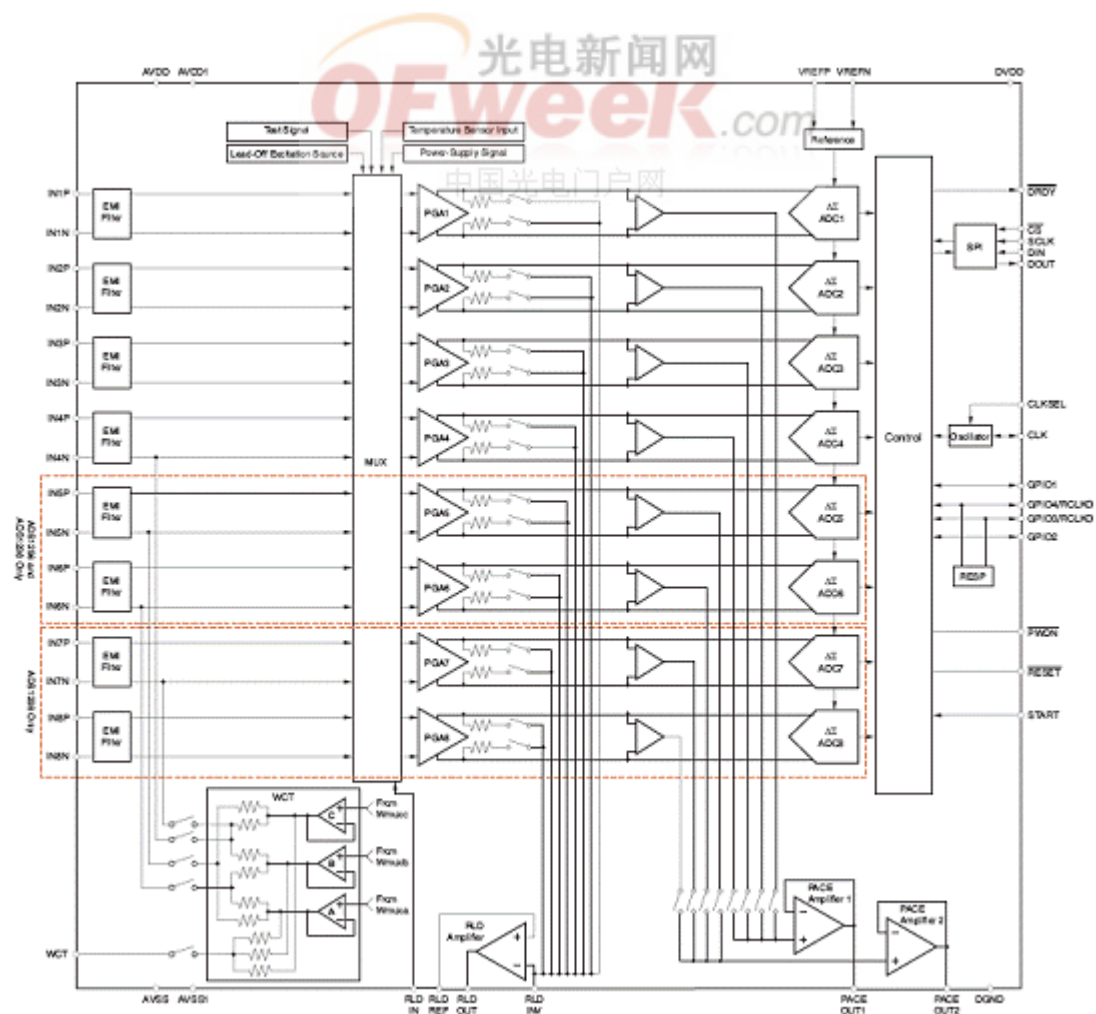


图 1.ADS1298 功能方框图

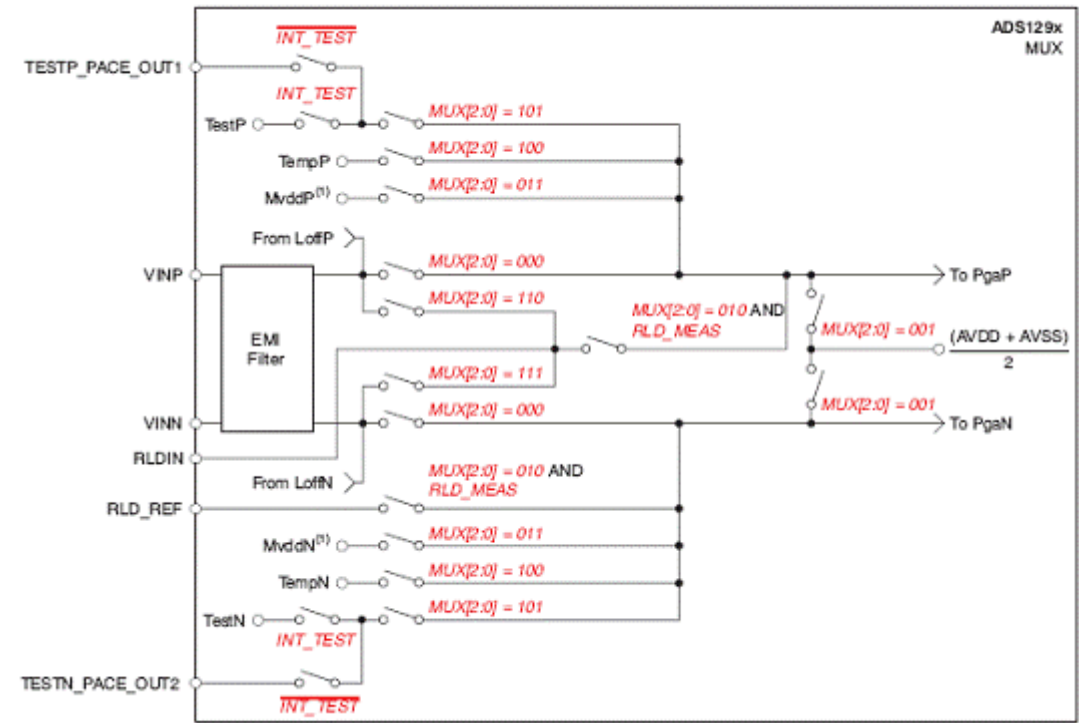
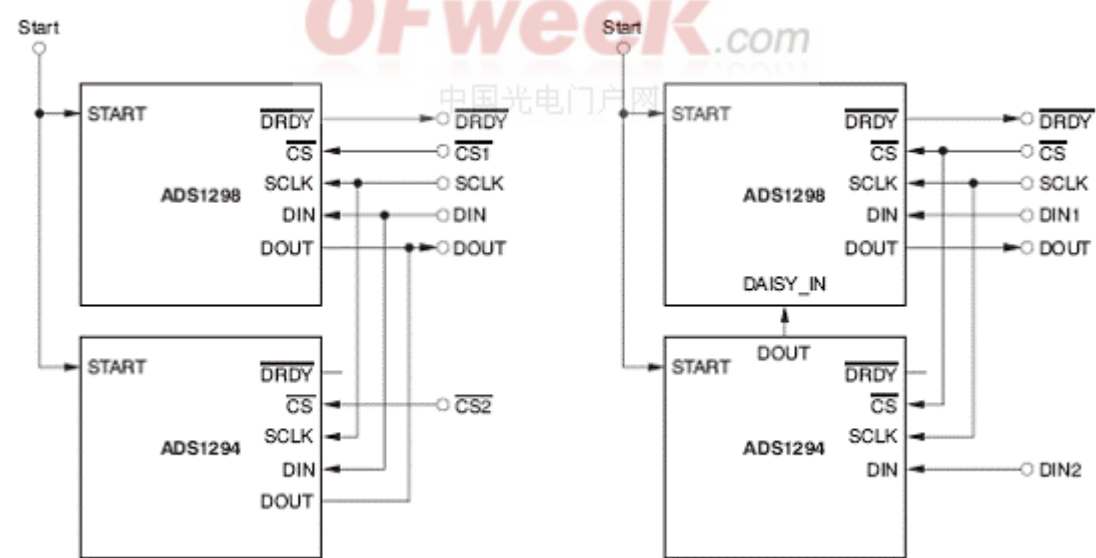


图 2.ADS1298 每路输入复接器方框图



a)标准配置

b) DAISY_IN 配置

图 3.多个器件配置图

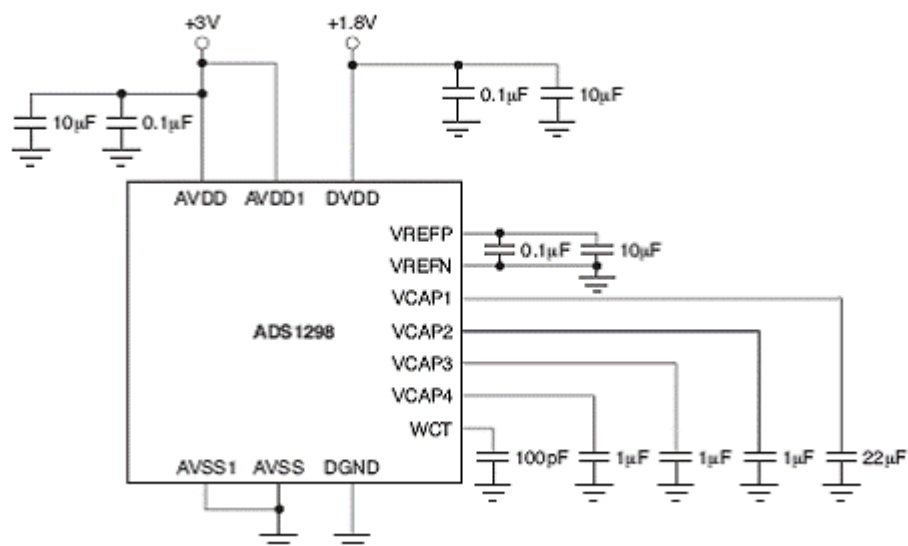
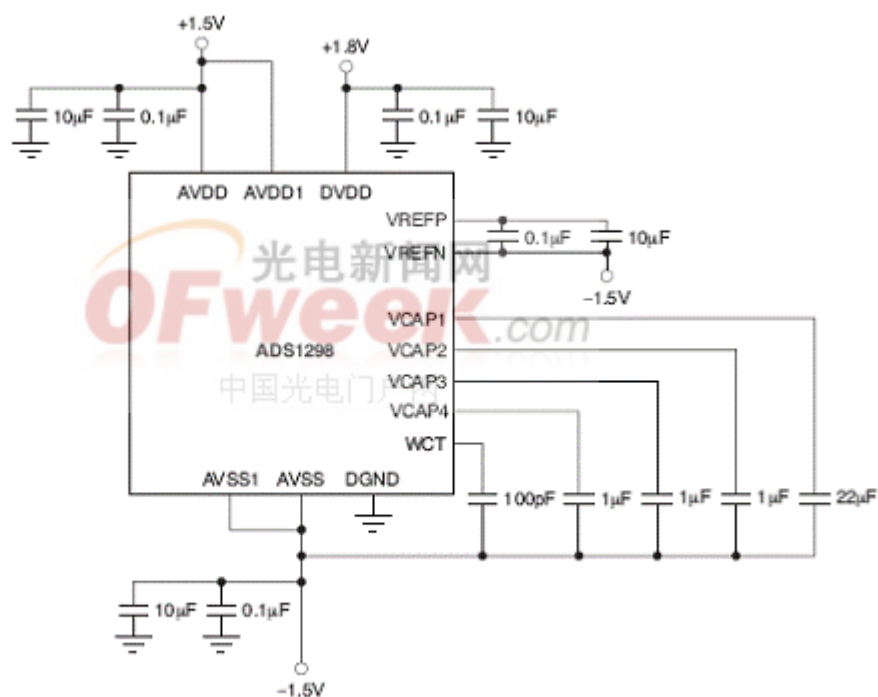


图 4.ADS1298 单电源连接框图



NOTE: Place the capacitors for supply, reference, WCT, and VCAP1 to VCAP4 as close to the package as possible.

图 5.ADS1298 双电源连接框图

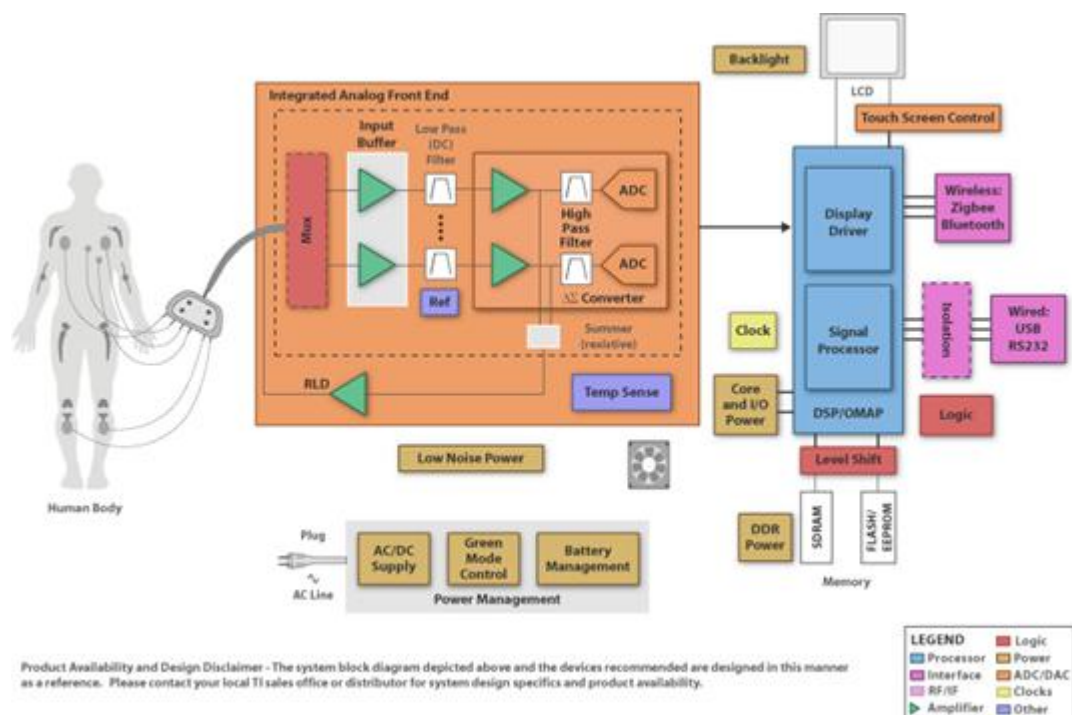


图 6.心电图(ECG)方框图