晶华
SDIC Micro



芯片产品手册
PRODUCT MANUAL

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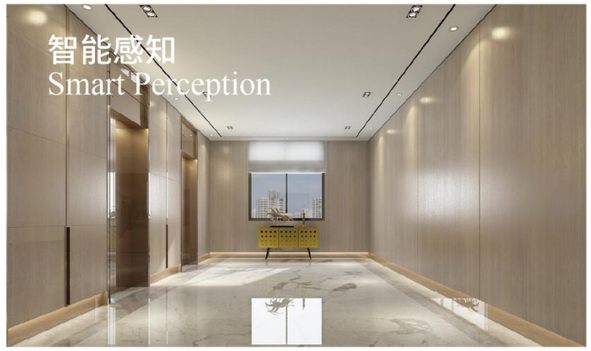
杭州晶华微电子股份有限公司
Hangzhou SDIC Microelectronics Inc.

专业混合信号集成电路设计及应用方案供应商
Professional mixed-signal IC design and application provider









杭州晶华微电子股份有限公司成立于2005年，致力于高性能、高品质混合信号集成电路设计及销售，以高集成度、高可靠性的创新设计能力及先进的品质保证体系，为用户提供一站式专业集成电路及产品化应用方案设计。

晶华微电子核心技术团队来自美国，拥有先进的模拟和数字集成电路设计、工艺、测试、可靠性技术、质量管理等丰富经验及国际化视野。多年来，公司坚持自主创新，已拥有低功耗和低噪声放大电路、不同结构的模/数及数/模转换器、电压基准源、MCU、混合信号SoC等多项核心技术，并申请获得多项专利/软著。公司自主研发的工控HART通讯控制器芯片及4~20mA电流DAC打破工控行业国外垄断，实现国内突破。

通过多年的技术积累与业务开拓，公司的通用模拟集成电路及系列专用SoC产品性能卓越、品质可靠。主要产品包括医疗电子芯片、智能健康衡器芯片、工业控制及仪表芯片、智能感知芯片等，其广泛应用于医疗健康、压力测量、工业控制、仪器仪表、智能家居等众多领域。其中，高精度、低功耗的24 bits ADC + 8 bits MCU类SoC一直保持国内电子秤及红外测温枪市场重要地位，年销售芯片上亿颗。

目前，公司总部位于杭州，已设立上海分公司，西安分公司，深圳子公司，业务已覆盖全国，产品远销美国、澳大利亚、德国、土耳其、印度、瑞典、以色列等。

未来，公司将继续以高精度ADC和模拟信号处理结合32 bits MCU技术为核心，深耕智慧医疗、智慧城市、智能制造、工业物联网等领域，与更多企业达成战略合作伙伴关系，推进公司跨越式发展，为社会提供卓越的产品和服务。

Hangzhou SDIC Microelectronics Inc. was founded in 2005. We specialize in high-performance, high-quality mixed-signal integrated circuit design. Our innovative design capability of high- integration, high-reliability, and advanced quality assurance system provides users with one-stop professional integrated circuit design and product application scheme design.

Our core technical team came from the United States with years of experience in high-end IC design, outstanding R & D capabilities, and superb global vision. We own a large variety of core IC technology and patents in related fields. We are the first mass producer of industrial control HART communication controller IC and 4~20mA current DAC.

Through years of technical accumulation and business development, the company's general analog integrated circuit and a series of special SoC products have excellent performance and reliable quality. Our main products include the ICs for medical, smart health weighing, industrial control and instruments for smart sensing purposes. They can be used in medical health, pressure measurement, industrial control, instrumentation, and smart home environment. We maintain the leading position in the domestic market with our high precision and low power 24 bits ADC + 8 bits MCU SoC. SDIC achieves sale figures of over 100 million chip per year.

The SDIC headquarters is in Hangzhou, China with established branches in Shanghai , Xi'an and Shenzhen. Our business covers the entire country and our products are sold internationally to the United States, Italy, Germany, Australia, Sweden, Turkey, India, and Israel.

In addition to our, focus on 32 bits MCU technology and high- analog signal processing, we are developing smart technology for healthcare, metropolis, manufacturing, and industrial IoT. We remain committed to working with our customers to provide excellent products and services to the worldwide community.

工控HART调制解调技术
低功耗、低误码率、
强抗干扰

Industrial control HART
Modem technology
Low power consumption,
low bit error rate,
strong anti-interference

24位ADC、16位DAC、
低噪声PGA等模拟信号链技术
高精度、高集成度

24 bits ADC, 16 bits DAC,
and low-noise PGA analog
signal chain technologies
High precision ,
highly integrated

基于8/32位CPU的SoC
丰富外设资源、
高性价比、高可靠性

The SoC is based
on 8/32 bits CPU,
peripheral resources,
Cost-effective and reliable

17

自主研发17年
技术积累深厚

17 years of independent
research with abundant
technology experience

50%

细分市场表现突出
份额超过50%

Outstanding performance
in selected markets
with over 50% market share

67%

成熟的IC设计团队
研发人员占比67%

Senior research and design
team representing 70% of
the employee population

1亿+

年销售芯片上亿颗

More than 100 million
chip sales annually



HART调制解调器芯片
HART Modem IC

推荐型号 | Recommended Parts：SD2017B 、SD2057、SD2085

SD2057是一款专为实现HART协议而设计的CMOS单片调制解调器芯片，器件集成了所有必要的滤波、信号检测、调制、 解调及HART 信号波形整形等功能，芯片只需少量外围无源元件，即可满足 HART 物理层规范功能要求。

SD2057 使用相位连续的频移键控 FSK 技术，传输速率为 1200 位/秒，采用半双工通信，符合HART协议物理层要求。芯片调 制模式的最大电源电流在5.5V电压及外部 3.6864MHz 时钟下为 112μA。

The SD2057 is a CMOS single chip modem IC used in Highway Addressable Remote Transducer (HART) field instruments and masters. This IC integrates all necessary filtering, signal detection, modulating, demodulating, and HART signal wave shaping functions. Thus it requires few external passive components to satisfy the HART physical layer requirements.

The SD2057 uses phase continuous Frequency Shift Keying (FSK) at 1200 bps, and operates in half duplex mode per HART protocol. The maximum supply current consumption in transmit mode is 112μA while using 3.6864MHz external Clock source input and 5.5V power supply.

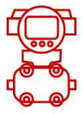
芯片特点：

- 符合 HART 通信协议物理层要求
- 符合 Bell202 标准载波 1200Hz 和 2200Hz
- 内部集成接收滤波器，所需外部元件极少
- HART 波形整形输出具有额外驱动能力
- UART 接口
- 工作电压 2.7~5.5V
- 低功耗,调制模式下最大功耗为 112μA
- -55°C至+125°C工作温度范围

Features:

- Meets HART physical layer requirements
- Bell 202 shift frequencies of 1200Hz and 2200Hz
- Integrated receive filter, minimal external components required
- Buffered HART output for drive capability
- UART interface
- 2.7V to 5.5V power supply
- 112μA maximum supply current in transmit mode
- -55°C to +125°C operation range

应用方案 | Applications：


压力变送器
Pressure Transmitter


流量计
Manuscript


温度变送器
Thermometer Pressure Transmitter


HART手操器
HART
Field Communicator



4~20mA DAC芯片
4~20mA DAC IC

推荐型号 | Recommended Part：SD2421A

SD2421A是一款采用Σ-Δ架构，保证16位分辨率和单调性，最大±0.01%积分非线性，环路供电型4~20mA数模转换器，将数字数据转换成为电流输出。

SD2421A专为满足工业控制领域的需求而设计，其高集成、高精度、低成本解决方案，实现高分辨率4~20mA电流输出，为实现精确稳定智能仪器仪表提供设计基础。广泛应用于工业控制领域中的智能温度变送器、智能压力变送器、智能阀门定位器等。

The SD2421A is a complete 4~20mA loop powered DAC which converts digital signal into current. The DAC uses Σ-Δ architecture. It guarantees 16 bits resolution and monotonicity, and ±0.01% integral nonlinearity. Its large scale integration, high precision, and low cost design is specifically well suited for smart 4~20mA transmitter manufacturer in the industrial control area.

SD2421A is widely used in industrial temperature control, intelligent temperature transmitters, intelligent pressure transmitters, intelligent valve positioners, etc.

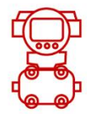
芯片特点：

- 4~20mA电流输出
- 16位分辨率和单调性
- ±0.01%积分非线性
- 3V/3.3V/5V稳压器输出
- 2.5V和1.25V精密基准电压源输出
- 最大静态电流520μA
- 兼容HART®通信协议
- 过流保护以及短路保护
- -40~+85°C工作温度范围

Features:

- 4~20mA current output
- 16 bits resolution and monotonicity
- ±0.01% integral nonlinearity
- 3V/3.3V/5V selectable voltage source
- 2.5V and 1.25V precision reference
- 520μA maximum quiescent current
- HART® compatible
- Short circuit protection and over current protection
- -40°C to +85°C operating range

应用方案 | Applications：


压力变送器
Pressure Transmitter


流量计
Manuscript


温度变送器
Thermometer Pressure Transmitter


阀门定位器
Valve Positioner



信号调理及变送芯片
Signal Processing and Transducing IC

推荐型号 | Recommended Parts：SD23M101、SD23M201

SD23M101是一颗高度集成的用于电压型传感器信号调理和变送输出芯片。集成外部JFET控制器，24位主信号测量ADC和24位辅助温度测量ADC，PGIA，双路恒流源等电路，支持SPI、IIC、UART通信，模拟电压输出，4~20mA变送输出，PWM/PDM输出等模式。内部包含32k MCU。高度集成，SD23M101仅需最少的外部器件，即可实现压力或温度变送器方案开发。支持HART通信，可实现远传和物联网应用。另通过内置校准算法，可实现传感器温补和非线性校准，综合精度优于0.1%。

SD23M101 is a highly integrates signal processing and transducing IC.It is integrated with external JFET controller, 24 bits signal measurement ADC and 24 bits auxiliary temperature measurement ADC, PGIA, dual constant current source and other circuits. It supports SPI, IIC, UART communication, analog voltage output, 4~20mA transmission output, PWM/PDM output and other modes. The IC is built-in with 32K MCU and higly integrated and very few external components are needed to achieve the development of pressure or temperature transmitter applications. HART communication is compatible for Internet of Things application. SD23M101 also includes.

sensor for temperature compensation and nonlinear calibration. The comprehensive accuracy is better than 0.1%.

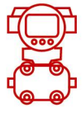
芯片特点：

- 32 bits MCU，最高1.8432MHz工作频率，32k Bytes MTP，2k Bytes SRAM，512 Bytes EEPROM
- 内置3.6864 MHz RC振荡器，校准后在-40~125℃温度范围内典型误差小于±1%
- 内置双24 bits ADC，低噪声PGA，支持差分和单端输入，可切换至内部温度传感器
- 内置高精度16 bits DAC，支持比例和绝对型电压输出（0~2.5V/0~5V/0~10V），支持4~20mA电流输出
- 内置一路电压激励源，激励电压可选为2.5V和4V
- 内置两路电流激励源，激励电流100μA、250μA、500μA和750μA可选
- 内置低温漂基准，温漂典型值为5ppm℃，最大值为10ppm/℃
- 支持OWI、UART、SPI和I²C通信，16 bits PWM/PDM输出，4个GPIO，带有三个外部中断
- 内置高压电源管理模块支持6.5~40V宽电压供电
- 工作温度范围：-55~125℃

Features:

- 32 bits MCU, 1.8432 MHz operating clock rate, 32k Bytes MTP, 2k Bytes SRAM, 512 Bytes EEPROM
- Built-in 3.6864 MHz RC oscillator, typical error is less than ±1% at -40~125℃ after calibration
- Built-in double 24 bits ADC, low noise PGA, 1 differential or two single-ended inputs. Internal temperature sensor input is selectable.
- High precision 16 bits DAC, supports proportional and absolute voltage output (0~2.5V/0~5V/0~10V),Operating current is 4~20mA
- Built-in one way voltage incentive. 2.5v and 4v are selectable.
- Built-in two way current incentive. 100μA, 250μA, 500μA and 750μA are selectable
- Built-in low temperature drift benchmark. Typical value is 5ppm℃, maximum is 10ppm℃
- OWI, UART, SPI and I²C communication ports. There are 4 GPIO includes 3 external interrupts
- Operating voltage range: 6.5~40V. Built-in high voltage power management module
- Operating temperature range: -55~125℃

应用方案 | Applications：



压力变送器
Pressure Transmitter



流量计
Manuscript



温度变送器
Thermometer Pressure Transmitter



数显仪表芯片
Digital Display Instrument IC

推荐型号 | Recommended Parts：SD3102、SD3302、SD3101

SD3102是一颗高度集成的交直流数显表头芯片，包括高精度ADC、交流真有效值测量电路、PWM、UART、显示驱动等表头常用外设，外围电路简单。采用低功耗设计，支持休眠和待机模式，非常适合电池供电应用。

除通用仪表芯片外，还包括集成4~20mA无源表、温控仪、温度巡检仪、交直流表头、多功能仪表等成熟方案的专用芯片，只需完成PCB设计，便可实现整个产品功能。

SD3102 is a highly integrates CMOS SoC with built-in 24 bits ADC, AC true value measuring circuit, PWM, UART and display driver. Peripheral circuit is simple. The IC was designed with ultra-low power technology. Three working modes, normal mode, standby mode, and sleep mode, are provided. It is suitable for battery-powered applications.

Besides nniversal transmitter instrument, it is also suitable for 4~20mA passive meter, temperature controller, temperature inspection instrument, AC/DC voltmater or current meter and multi-function digital display meter. The entire product function can be acheived by completing the PCB design.

芯片特点：

- 24位高精度ADC，包括多组差分输入通道
- 可测量信号的瞬时值、真有效值和频率
- 内置LCD驱动，显示范围最大支持10SEG×4COM
- 内置1.16V低温漂基准
- 内置RTC模块，提供年、月、星期、日、时、分和秒功能
- 内置UART、I²C、PWM、PFD、TIMER、Buzzer、INT等功能
- 包括掉电检测电路和上电复位电路
- 集成度高，外部器件极少
- 工作电压范围：2.5~3.6V，支持低功耗模式
- 工作温度范围：-40~85℃

Features:

- High precision 24 bits ADC, Multiple differential input
- Instantaneous value, true effective value and frequency of the signal are mearsurable
- Built-in 10SEG X 4COM LCD drive
- Built-in 1.16V low TC voltage reference
- Built-in RTC module includes the unit of year, month, week, day, hour, minute and second
- Built-in UART, I²C, PWM, PFD, TIMER, Buzzer and INT
- Low voltage detection and power on reset circuit
- Highly integrated and very few external components are needed
- Operating voltage range: 2.5~3.6V
- Operating temperature range: -40~85℃

应用方案 | Applications：



数显表头
Digital Display Instrument



4~20mA无源表
4~20mA passive meter



多功能仪表
Multi-function digital display meter



温控仪
Temperature controller



就地显示温度表头
Local Display Temperature Meter



计量仪表及万用表芯片
Digital Multimeter IC

推荐型号 | Recommended Parts：SD7501、SD7890、SD7830

SD7501内部集成TRMS测量功能（带宽2KHz），LCD显示驱动，UART通信接口，可测量交直流电压、交直流电流、频率、电阻、电容、二极管(压降最大3.3V)、三极管、通断、温度、NCV、通信、脉冲输出等数字万用表常见功能，支持自动档、手动挡两种工作模式，最高可实现6000 Counts稳定测量。

芯片内部针对数字万用表应用方案集成了多功能网络，将高精度电阻集成至芯片内部，温漂参数和一致性更好，降低了外部电路的复杂程度。支持数字校准，大大缩短校表时间。

SD7501 integrates with TRMS measurement function, LCD driver and UART to achieve different digital meter function such as AC/DC voltage, AC/DC current, frequency, resistance, capacitance, diode (voltage drop maximum 3.3V), triode, on-off, temperature, NCV, communication and pulse output etc. The IC supports manual or auto-range multimeter measurement and can be reached to 6000 counts.

The IC integrates multi-function network for digital multimeter application solutions, and integrates high-precision resistors and makes the temperature drift parameters and consistency better, and reduces the complexity of the external circuit. SD7501 supports digital calibration to shorten the calibration time.

芯片特点：

- 高精度 ADC，可实现 4000 或 6000 分度测量
- 交流真有效值输出，2kHz 带宽处误差不超过 0.5%
- 芯片内置分压电阻，无需外部电阻分压
- 可编程多功能测量网络，支持电压，电流，电阻，二极管，三极管，通断，温度，电容和频率等测量
- 内置 charge pump，可测试 3V 二极管
- 24 位计数器 TMRA、TMRB 和 TMRC，用于频率或占空比测量
- 丰富的外围资源：UART，PWM，PFD，BUZ，TIMER
- 18SEG×4COM 液晶驱动电路，超低功耗和大驱动能力设计；内含程控升压模块，可在低压条件下维持高亮显示，支持灰度调节

Features:

- High precision ADC, 4000 or 6000 counts, auto-range measurement
- AC true RMS output, measurement error<0.5% at 2kHz passband corner
- Built-in voltage divider, no external resistor divider needed
- Programmable multi-functional measurement network, support voltage, current, resistor, diode, transistor, open/short, temperature, capacitor, and frequency measurements
- Built-in charge pump, can measure 3V diode
- 24 bits TMRA, TMRB, and TMRC arithmetic units for frequency and duty cycle calculations
- Abundant peripheral resources: UART, PWM, PFD, BUZ, and TIMER
- 18SEG×4COM LCD drive, ultra-low power consumption and high driving capability, programmable boost module to maintain luminance at low supply voltage, support grey

应用方案 | Applications：



数字万用表
Digital Multimeter



带高精度ADC的SoC芯片
SoC with High Precision ADC

推荐型号 | Recommended Parts：SD8114、SD8115、SD8302

SD8114是带24位ADC的SoC产品，程序存储器8k Bytes OTP，可以低压自烧录，烧录电压范围：2.4~3.6V，用于替代外部EEPROM。外围只需要4个电容，器件很少，非常适合人体秤等家用秤应用。

超低功耗设计，使用内部4 MHz RC振荡器经内部电路处理而产生的2MHz时钟工作，3V工作电压下，整个芯片在典型应用时的工作电流只有1mA（不包括传感器功耗），非常适合电池供电的应用。

The SD8114 is a CMOS SoC with built-in 24 bits ADC and 8k Bytes OTP memory. The built-in OTP has low programming voltage at 2.4~3.6V. It can be used in place of external EEPROM. Only 4 capacitors are needed, which is very suitable for household scale applications such as body scales.

The IC was designed with ultra low power technology. Operating at 2MHz operating clock rate sourcing from internal 4 MHz RC oscillator and 3V supply, the total typical operating current is 1mA (external transducer driving current not included). Such low current consumption is very suitable for battery powered applications.

芯片特点：

- 8 位 RISC 超低功耗 MCU，6 级堆栈，8k Bytes OTP，256 Bytes SRAM
- 高精度 ADC，ENOB=17.6bits@8sps，稳压源内部可选
- 低噪声高输入阻抗前置放大器，增益可选
- 内置 4MHz 与 32kHz RC 振荡器；8 位 TIMER；Watch Dog Timer
- 4COM×17SEG 液晶驱动
- 内置硅温度传感器；内置 UART
- 工作电压：2.4~3.6V

Features:

- 8 bits RISC ultra low power MCU, 6 stack levels. 8k Bytes OTP, 256 Bytes SRAM
- High precision ADC, ENOB=17.6bits@8sps，selectable voltage source
- Low noise, high input impedance preamplifier with selectable gain
- Built-in 4MHz, 32kHz RC oscillators；8 bits TIMER；Watch Dog Timer
- 4COM×17SEG LCD drive
- Built-in temperature sensor, UART
- Operating voltage range: 2.4~3.6V

应用方案 | Applications：



厨房秤
Kitchen Scale

手提秤
Portable Scale

人体秤
Body Scale

胎压计
Tire Pressure Scale



脂肪秤专用芯片
Body Scale IC

推荐型号 | Recommended Parts： SD8518S、SD8318 、SD8017B

SD8518S是带24位ADC的SoC产品，程序存储器为16kBytes OTP，超低功耗设计，使用内部RC振荡器的4分频工作，3V工作电压下，典型应用时的工作电流只有1.5mA。

外围资源丰富：RTC，UART，可选的多种稳压电源输出，灵活设置的PGIA模块，升压模块，带有CAPTURE功能的TIMER，PWM和PFD输出模块，LCD驱动等。

本产品带16k Bytes OTP，可以低压自烧录，烧录电压范围：2.4~3.6V，OTP可以替代EEPROM使用。

The SD8518S is a CMOS SoC with built-in 24 bits ADC and 16k Bytes OTP memory. The IC was designed with ultra-low power technology. Operates at 3V supply and quarter internal RC oscillator frequency, the total typical operating current is 1.5mA.

It has very rich peripheral resources: RTC, UART, selectable regulated voltage source, flexible PGIA setup, voltage booster, TIMER with CAPTURE capability, PWM, PFD, and LCD driver.

The OTP can be programmed in situ and the 2.4~3.6V programming voltage is generated internally. The OTP can be used in place of external EEPROM.

芯片特点：

- 8 位 RISC 超低功耗 MCU，6 级堆栈，16k Bytes OTP，512 Bytes SRAM
- 高精度 ADC，ENOB=18.7bits@8sps；8bits DAC
- 低噪声高输入阻抗前置放大器，增益可选
- 内部 8MHz 与 32kHz RC 振荡器
- 外围资源：RTC，UART，PWM，PDM，PFD，CAPTURE，TIMER，红外载波 / 正弦波发生器
- 最大 8COM×36SEG 液晶驱动
- 工作电压：2.4~3.6V

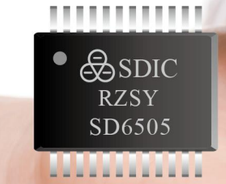
Features:

- 8 bits RISC ultra-low power MCU， 6 stack levels. 16K Bytes OTP, 512 Bytes SRAM
- High precision ADC, ENOB=18.7bits@8sps; 8bits DAC
- Low noise, high input impedance preamplifier with selectable gain
- Built-in 8MHz, 32kHz RC oscillators
- Abundant peripheral resources: RTC, UART, PWM, PDM, PFD, CAPTURE, TIMER, infrared carrier generator, sine wave generator
- 8COM×36SEG LCD drive
- Operating voltage range: 2.4~3.6V

应用方案 | Applications：



四电级交流脂肪秤、计价秤等高精度电子秤
Four Electrodes AC Health Scale, Cash Register Scale



ADC/AFE

推荐型号 | Recommended Parts： SD6505、SD6500

SD6505内置24 位ADC、LED 驱动、两线制通信等电路。

LED驱动电路最多可驱动56个共阴极LED，最大驱动电流14mA，可保证白光LED足够的亮度。

两线制通信可用于本产品与上位机进行通信，上位机可读/写本芯片的所有寄存器。

本芯片还支持定时测量比较模式，进入该模式后，数据比较成功可唤醒主机，主机也可独立唤醒本芯片。

本芯片还内置正弦波发生器，温度传感器，8 bits DAC 等，可满足多种应用的要求。

SD6505 is a CMOS with built-in 24 bits ADC, LED driver and two wires communication circuits.

The LED driver circuit can drive up to 56 common cathode LEDs with a maximum current of 14 mA to ensure sufficient brightness of the white LED.Two wires communication can be used to communicate with the host computer, and the host computer can read and write all the registers of the IC.

The IC also supports the timing measurement comparison mode. After entering this mode, the host can be waked up if the data is successfully compared, and the host can also wake up the IC independently.

The IC also has a built-in sine wave generator, temperature sensor and 8bits DAC, etc. which can fulfil the requirements of a variety of applications.

芯片特点：

- 高精度 ADC，ENOB=19.3bits@8sps；8bits DAC，稳压源可选
- 低噪声高输入阻抗前置放大器，增益可选
- 内部 8 MHz RC 与 32 kHz 振荡器
- 两线制通信接口
- 8 个 LED 驱动口
- 内置正弦波发生器及整流电路，频率可选
- 内置温度传感器；具有硬件定时比较测量功能
- 工作电压：2.4~3.6V

Features:

- High precision ADC, ENOB=19.3bits@8sps；8 bits DAC, selectable voltage source
- Low noise, high input impedance preamplifier with selectable gain
- Built-in 8MHz, 32kHz RC oscillators
- Two wires communication interface
- Provide 8 LED drive ports
- Built-in sine wave generator and rectifier circuit, the frequency can be selected
- Built-in temperature sensor, supports single point calibration. Provide hardware timing comparison measurement function
- Operating voltage range: 2.4~3.6V

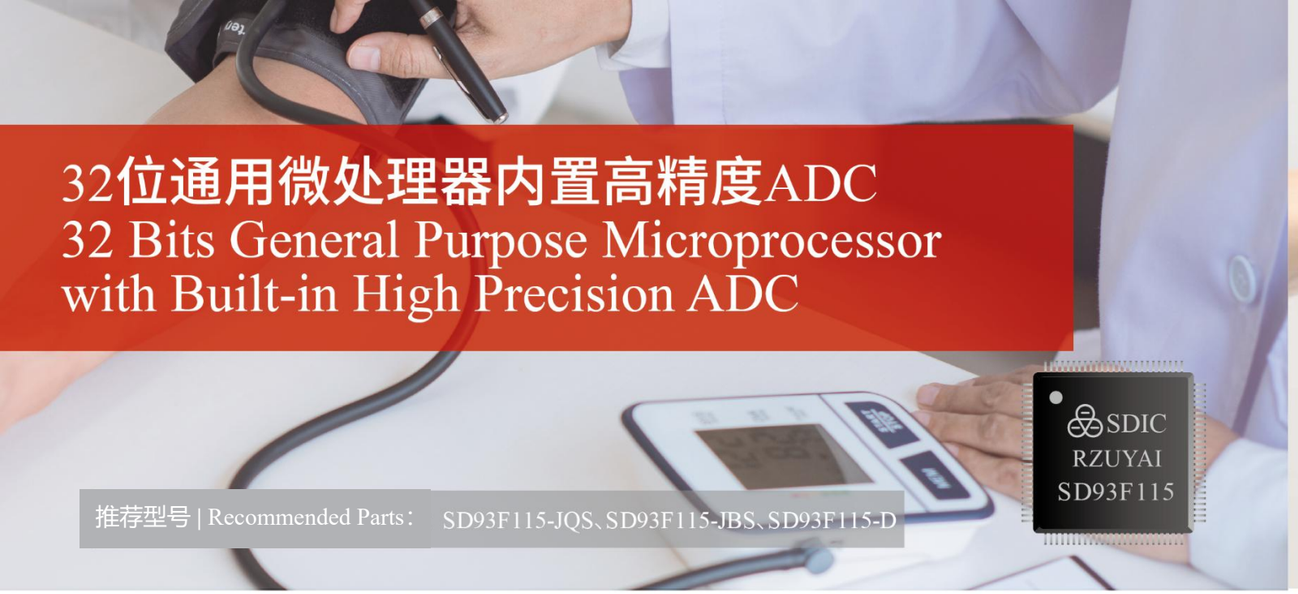
应用方案 | Applications：



四电级交流脂肪秤、计价秤等高精度电子秤
Four Electrodes AC Health Scale, Cash Register Scale



血糖仪
Blood Glucose Meter



32位通用微处理器内置高精度ADC
32 Bits General Purpose Microprocessor with Built-in High Precision ADC

推荐型号 | Recommended Parts： SD93F115-JQS、SD93F115-JBS、SD93F115-D

SD93F115-JQS是带有LCD驱动和24位高精度ADC的32位 MCU的SoC，提供120k Flash空间用于存储用户程序，工作电压范围在2.4~5.5V之间。

本芯片为32位的系统芯片，可以字节、半字（16位）、全字（32位）访问，系统时钟上电默认为12MHz，可通过寄存器配置选择不同时钟作为系统时钟，最高可配置为24MHz。

本芯片提供四种工作模式，让用户可以在工作效率和能量消耗方面得到最佳选择，四种模式分别是：正常工作模式、待机（WAIT）模式、休眠(DOZE)模式和深度休眠(STOP)模式。

SD93F115-JQS is a 32 bits MCU CMOS SoC with built-in high precision 24 bits ADC and LCD driver. There are 120K Flash storage to store the programme. Operating voltage range is 2.4~5.5V.

SD93F115-JQS is a 32 bits system IC, it can be reached by byte, half type word (16 bits) and full type word (32 bits). The powered systme clock is default to 12 MHz. Different clock can be selected as system clock through the register configuration and the highest frequency is 24 MHz.

Four working modes are provided so users can select the optimum choice between speed and power. They are normal mode, standby mode (WAIT), sleep mode (DOZE) and deeply sleep mode (STOP).

芯片特点：

- 32位MCU，24位高精度ADC，12位SAR ADC
- 内置传感器激励输出
- 带LCD驱动模块，支持多种驱动模式
- 内置正弦波发生器，输出频率可选，支持八电极BIA测脂
- 内置两个运算放大器OPA和OPB
- 内置UART、I²C、SPI、PWM/PDM、TIMER、BUZZER、INT、RTC
- 内置硅温度传感器
- 工作电压：2.4 ~5.5V

Features:

- 32 bits MCU, 24 bits High precision ADC，12 bits SAR ADC
- Built-in sensor excitation output
- LCD drive, Support multiple driver modes
- Built-in sine wave generator, frequency selectable, support Eight-electrode BIA fat measurement
- Two built-in operational amplifiers: OPA and OPB
- Built-in UART、I²C、SPI、PWM/PDM、TIMER、BUZZER、INT、RTC
- Built-in temperature sensor
- Operating voltage range: 2.4~5.5V

应用方案 | Applications：



八电极交流体脂秤
Eight-Electrode AC Body Scale



血压计
Sphygmomanometer



血氧计
Oximeter



红外测温信号处理芯片
Infrared Thermometer SoC

推荐型号 | Recommended Parts： SD8709、SD8016B、SD8303X

SD8709是高精度24位ADC的SoC产品，外围资源丰富：RTC，可选择多种稳压电源输出，灵活设置PGIA模块，升压模块，UART、I²C、SPI、TIMER、PWM/PDM、PFD、CAPTURE输出模块，LCD驱动等。

本产品带16k Bytes OTP，可以低压自烧录，烧录电压范围：2.4~3.6V，OTP可以替代EEPROM 使用。

超低功耗设计，典型应用时整个芯片工作电流约为1mA（IAD=0）或 1.5mA（IAD=1）。

The SD8709 is a CMOS SoC with built-in 24 bits ADC and abundant peripheral resources: RTC, selectable voltage sources, flexible PGIA, voltage step-up module, UART, I²C, SPI, TIMER, PWM/PDM, PFD, CAPTURE, and LCD driver.

The OTP can be programmed in situ and the 2.4~3.6V programming voltage is generated internally. The OTP can be used in place of external EEPROM.

The IC was designed with ultra-low power technology. Typical total operating current is only 1mA (IAD=0) or 1.5mA (IAD=1).

芯片特点：

- 8 位 RISC 超低功耗 MCU，16k Bytes OTP，512 Bytes SRAM
- 内部 4 MHz 与 32 kHz RC 振荡器
- 高精度 ADC，ENOB=18.8bits@8sps；ADC 基准可选
- 低噪声高输入阻抗前置放大器，增益可选
- 4COM×24SEG 液晶驱动
- 内有硅温度传感器
- 外围资源：UART，I²C，SPI，PWM/PDM，PFD，TIMER(CAPTURE)，RTC
- 工作电压：2.4~3.6V

Features:

- 8 bits RISC ultra-low power MCU. 16K Bytes OTP, 512 Bytes SRAM
- Built-in 4 MHz, 32 kHz RC oscillators
- High precision ADC, ENOB=18.8bits@8sps, ADC reference is selectable
- Low noise, high input impedance preamplifier with selectable gain
- 4COM×24SEG LCD drive
- Built-in temperature sensor
- Abundant peripheral resources: UART，I²C，SPI，PWM/PDM，PFD，TIMER(CAPTURE)，RTC
- Operating voltage range: 2.4~3.6V

应用方案 | Applications：



红外测温枪
Infrared Thermometer



额温枪
Frontal Thermometer



耳温枪
Ear Thermometer



数字温度传感器芯片
Digital Temperature Sensor IC

SD5075是一款高准确度温度传感器芯片，内含高精度测温ADC，在-40~+100℃范围内典型误差小于±0.5℃，在-55~+125℃范围内典型误差小于±1.0℃。通过两线I²C/SMBus接口可以很方便与其他设备建立通信。设置A2~A0的地址线，可支持8片芯片并联总线连接。

SD5075 is a highly accurate temperature measurement IC with built-in high resolution ADC. The typical error is ± 0.5℃ for the -40~+100℃ range, and ±1.0℃ for the -55~+125℃ range. It supports two wires I²C/SMBus interface. Up to eight chips can share the communication interface in parallel by setting the address A2~A0.

芯片特点：

- 12 位数字温度读数，分辨率为 0.0625℃
- 在 -40~+100℃范围内典型误差小于 ±0.5℃
- 在 -55~+125℃范围内典型误差小于 ±1.0℃
- 2 线通信接口，兼容 I²C/SMBus 协议
- 提供过温报警功能，可设置阈值及迟滞量
- 可选“连续测温模式”或“单次测温模式”
- 低功耗：测温时典型工作电流只有 170μA，
- 关断模式工作电流小于 1μA
- 工作电压范围：2.7~5.5V
- 管脚兼容 ADT75/LM75A/TMP75

Features:

- 12 bits digital temperature readout, 0.0625℃ resolution
- ±0.5℃ typical error at -40~+100℃ range
- ±1.0℃ typical error at -55~+125℃ range
- Two wires communication interface, compatible with I²C/SMBu protocol
- Over-temperature alarm function, user settable alarm threshold and hysteresis
- Continuous or single measurement options
- Low power consumption: 170μA typical during measurement,
- less than 1μA at shutdown mode
- 2.7~5.5V power supply range
- Pin compatible with ADT75/LM75A/TMP75

应用方案 | Applications：

智慧农业
Intelligence Agriculture

体温测量
Temperature Measurement

13 / www.SDICmicro.cn



推荐型号 | Recommended Parts： SD5820A、SD5075、SD5020A

SD5820A是一款高准确度温度传感器芯片。支持单总线通信，可输出9到12位数字温度数据，在-10~+85℃范围内典型误差±0.5℃。过温报警阈值可通过内置寄存器设定。另外，SD5820A可使用通信线直接供电（“寄生电源模式”），从而消除了对电源供电的要求。

SD5820A is a highly accurate temperature measurement IC that supporting single wire communication and can ouput 9-12 digits of temperature information. The typical error is ± 0.5℃ for the -10~+85℃ range. Overheat alarm can be adjusted by the internal setting. The SD5820A can be powered directly from the communication line ("parasitic power mode") to eliminating the need for power supply.

芯片特点：

- 12 位数字温度读数，分辨率为 0.0625℃
- 在 -10~+85℃范围内典型误差小于 ±0.5℃
- 在 -55~+125℃范围内典型误差小于 ±0.8℃
- 单总线通信接口，可使用通信线进行供电，带 CRC 校验功能
- 可设置 64 位的从机通信地址
- 灵活设置过温报警阈值
- 工作电压范围：2.7~5.5V
- 兼容 DS18B20

Features:

- 12 bits digital temperature readout, 0.0625℃ resolution
- ±0.5℃ typical error at -10~+85℃ range
- ±0.8℃ typical error at -55~+125℃ range
- Single wire communication interface and can be powered by communication line with CRC check function
- 64-bit slave communication address can be set
- Flexible setting of over temperature alarm
- 2.7~5.5V power supply range
- Compatible with DS18B20

工业测温
Industrial Temperature Measurement

水温探头
Water Temperature Sensor

14 / 杭州晶华微电子股份有限公司



红外感应(PIR)芯片
PIR Signal Process

推荐型号 | Recommended Parts：SD4101R-1、SD4101、SD4102

SD4101R-1是一个CMOS工艺集成的PIR(Passive Infra-Red)控制器芯片，功耗很低。

其内部构架采用模拟及数字混合电路的Mixed-mode方式设计，各种情况下使用皆十分稳定。

采用PIR人体热释红外线探测技术方案，内置高精度算法单元，可自调整适应当前环境，滤除环境干扰，有效提取人体信号，最远感应距离高达十几米。实际应用电路相当简单，研发、生产无需调试，大幅降低生产成本、节省空间。

SD4101R-1 is an integrated PIR (Passive Infra-Red) controller IC with very low power consumption. Its internal analog and digital mixed signal design architecture results in very stable operation under various environment conditions.

SD4101R-1 employs PIR human pyroelectric infrared detection technology. It has built-in high precision algorithm that is adaptable to current environment, filters out ambient interference, and effectively extracts human signals. The sensing range is more than ten meters. Application circuits are simple, and do not need tuning during development or production, thus saving product space and manufacturing cost.

芯片特点：

- 工业级标准，稳定性好
- 内置运算放大器和高精度算法单元，可自适应环境
- 感应距离远，感应灵敏度可调节
- 控制信号输出延迟时间可调节
- 内置屏蔽时间定时器，有效抑制重复动作
- 多路模拟输入和多路数字输出
- 可外接光敏三极管或光敏电阻，白天不工作

Features:

- Industry standard, good stability
- Built-in amplifier, high-precision algorithm unit, adaptive to ambient environment
- Long sensing range, Adjustable sensitivity for convenient usage
- The output delay time of control signal can be adjusted
- Built-in masking time, effectively inhibits repetitive malfunction
- Multi-channel analog input and multi-channel digital output
- Connect external photo-transistor or photo-resistor to inhibit day light working

应用方案 | Applications：



楼道感应灯
Corridor Induction lamp



报警灯
Alarm lamp



太阳能感应灯
Solar Energy Induction lamp

客户服务体系
Customer Service System



合作伙伴
Cooperative Partner

产品选型表 | Products Selection Table

带高精度ADC的SoC | SoC With High Precision ADC								
型号 Part Number	工作电压 Operating Voltage	工作电流 Operating Current	OTP	SRAM	ADC ENOB	显示 Display	外设 Peripherals	应用领域 Application Area	封装 Package
SD8000T	2.4~3.6V	850μA	8k Bytes	256 Bytes	18.3bits@8sps Gain = 100	LCD 14SEG*4COM	/	电子秤、胎压计等 Electronic Scale, Tire Pressure gauge…	裸片 DIE
SD8000U	2.4~3.6V	1.1mA	8k Bytes	256 Bytes	18.3bits@8sps Gain = 100	LCD 14SEG*4COM	/		裸片 DIE
SD8020	2.4~3.6V	1mA	8k Bytes	256 Bytes	18.6bits@8sps Gain = 100	LCD 17SEG*4COM	UART		裸片 DIE
SD8000S	2.4~3.6V	650μA	16k Bytes	256 Bytes	18.1bits@15.6sps Gain = 100	LCD 14SEG*4COM	RTC	电子秤等 Electronic Scale…	裸片 DIE
SD8000V	2.4~3.6V	1.1mA	16k Bytes	256 Bytes	19.2bits@8sps Gain = 100	LCD 18SEG*4COM	RTC, UART	红外测温、电子秤等 Infrared Thermometer, Electronic Scale…	裸片 DIE
SD8000W	2.4~3.6V	1.1mA	16k Bytes	256 Bytes	19.5bits@8sps Gain = 100	LCD 20SEG*4COM	RTC, UART		裸片 DIE
SD8005B	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.8bits@8sps Gain = 100	LCD 24SEG*4COM	RTC, I²C, UART, SPI , PWM		裸片 DIE
SD8016B	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.7bits@8sps Gain = 128	LCD 40SEG*4COM	DAC, RTC, UART, PWM	红外测温、电子秤、血糖仪等 Infrared Thermometer, Electronic Scale, blood glucose meter…	裸片 DIE
SD8107	2.4~3.6V	850μA	8k Bytes	256 Bytes	18.3bits@8sps Gain = 100	/	/	电子秤、胎压计等 Electronic Scale, Tire Pressure gauge…	SOP16
SD8113	2.4~3.6V	850μA	8k Bytes	256 Bytes	18.3bits@8sps Gain = 100	LCD 14SEG*4COM	/		QFN32
SD8114	2.4~3.6V	1mA	8k Bytes	256 Bytes	18.6bits@8sps Gain = 100	LCD 17SEG*4COM	/		QFN32
SD8302	2.4~3.6V	1.1mA	16k Bytes	256 Bytes	19.5bits@8sps Gain = 100	LCD 10SEG*4COM	RTC, UART	电子秤等 Electronic Scale…	SSOP24
SD8115	2.4~3.6V	1.1mA	16k Bytes	256 Bytes	19.2bits@8sps Gain = 100	LCD 16SEG*4COM	RTC, UART		QFN32
SD8709	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.8bits@8sps Gain = 100	LCD 24SEG*4COM	RTC, I²C, UART, SPI, PWM	红外测温、电子秤、胎压计等Infrared Thermometer, Electronic Scale, Tire Pressure gauge…	QFN48
SD8108X	2.4~3.6V	850μA	16k Bytes	256 Bytes	18.5bits@8sps Gain = 100	LED 56点阵（pixels）	/	电子秤、胎压计等 Electronic Scale,Tire Pressure gauge…	SOP16
SD8303X	2.4~3.6V	850μA	16k Bytes	256 Bytes	18.3bits@8sps Gain = 100	LED 72点阵（pixels）	/		SSOP20

ADC/AFE

型号 Part Number	工作电压 Operating Voltage	ADC采样速率 ADC Sampling Rate	可选增益 Selectable Gain	ADC ENOB	正弦波发生器 Sine Wave Generator	显示 Display	外设 Peripherals	应用领域 Application Area	封装 Package
SD6500	2.4~3.6V	512kHz	1、4、8、16、32、64、128、256	19.3bits@8sps Gain = 128	/	/	DAC	高精度电子秤、红外测温和血压计等 High-precision electronic scale,Infrared Thermometer, Electronic Sphygmomanometer…	MSOP10
SD6505	2.4~3.6V	512kHz	1、4、8、16、32、64、128、256	19.3bits@8sps Gain = 128	5kHz, 50kHz, 100kHz, 200kHz	LED 56点阵（pixels）	DAC	四电极交流脂肪秤、高精度电子秤、血糖计、红外测温等 Four electrodes AC body fat scale, high-precision electronic scale, blood glucose meter, Infrared Thermometer…	SSOP24

脂肪秤专用芯片 | Body Scale IC

型号 Part Number	工作电压 Operating Voltage	工作电流 Operating Current	OTP	SRAM	ADC ENOB	显示 Display	外设 Peripherals	测脂方式 Fat Measurement Method	封装 Package
SD8017B	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.7bits@8sps Gain = 128	LCD 24SEG*4COM	DAC, RTC, UART, PWM	交流四电极 Four Electrodes AC	裸片 DIE
SD8018B	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.7bits@8sps Gain = 128	LCD 40SEG*4COM	DAC, RTC, UART, PWM		裸片 DIE
SD8318	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.7bits@8sps Gain = 128	LCD 24SEG*4COM	DAC, RTC, UART, PWM		LQFP48
SD8518S	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.7bits@8sps Gain = 128	LCD 40SEG*4COM	DAC, RTC, UART, PWM		LQFP64
SD6505	2.4~3.6V	1.5mA	/	/	19.3bits@8sps Gain = 128	LED 56点阵（pixels）	DAC		SSOP24

红外测温信号处理专用芯片 | Infrared Thermometer SoC

型号 Part Number	工作电压 Operating Voltage	工作电流 Operating Current	OTP	SRAM	ADC ENOB	显示 Display	外设 Peripherals	应用领域 Application Area	封装 Package
SD8000V	2.4~3.6V	1.1mA	16k Bytes	256 Bytes	18.3bits@8sps Gain = 100	LCD 18SEG*4COM	RTC, UART	红外测温、电子秤等 Infrared Thermometer, Electronic Scale…	裸片 DIE
SD8000W	2.4~3.6V	1.1mA	16k Bytes	256 Bytes	19.6bits@8sps Gain = 100	LCD 20SEG*4COM	RTC, UART		裸片 DIE
SD8005B	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.8bits@8sps Gain = 100	LCD 24SEG*4COM	RTC, I²C, UART, SPI , PWM		裸片 DIE
SD8016B	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.7bits@8sps Gain = 128	LCD 40SEG*4COM	DAC, RTC, UART, PWM	红外测温、电子秤、血糖仪等 Infrared Thermometer, Electronic Scale, blood glucose meter…	裸片 DIE
SD8303X	2.4~3.6V	850μA	16k Bytes	256 Bytes	18.3bits@8sps Gain = 100	LED 72点阵（pixels）	/	红外测温、电子秤、胎压计等Infrared Thermometer, Electronic Scale, Tire Pressure gauge…	SSOP20
SD8305	2.4~3.6V	1.1mA	16k Bytes	256 Bytes	19.6bits@8sps Gain = 100	LCD 20SEG*4COM	RTC, UART	红外测温、电子秤等 Infrared Thermometer, Electronic Scale…	QFN40
SD8709	2.4~3.6V	1.5mA	16k Bytes	512 Bytes	18.8bits@8sps Gain = 100	LCD 24SEG*4COM	RTC, I²C, UART, SPI , PWM		QFN48

32位通用微处理器内置高精度ADC | 32 bits general purpose microprocessor with built-in high precision ADC

型号	Flash	SRAM	ADC ENOB	SAR ADC	LCD	通信接口	外设	封装
Part Number	(Bytes)	(Bytes)				Communication Port	Peripherals	Package
SD93F112-D	56k	4k	19.1bits@15.2sps Gain=128	/	22SEG*4COM	1 UART, 1 I²C	RTC, 1 BUZ, 2 PWM/PDM, 2 OP, 2 DAC	裸片 DIE
SD93F112-IMR	56k	4k	19.1bits@15.2sps Gain=128	/	22SEG*4COM	1 UART, 1 I²C	RTC, 1 BUZ, 2 PWM/PDM, 2 OP, 2 DAC	QFN48
SD93F115-D	120k	8k	19.5bits@15.2sps Gain=128	√	44SEG*4COM	2 UART, 1 I²C, 1SPI	RTC, 2 BUZ, 2 PWM/PDM, 2 OP, 1 DAC	裸片 DIE
SD93F115-JQS	120k	8k	19.5bits@15.2sps Gain=128	√	44SEG*4COM	2 UART, 1 I²C, 1SPI	RTC, 2 BUZ, 2 PWM/PDM, 2 OP, 1 DAC	LQFP100
SD93F115-JBS	120k	8k	19.5bits@15.2sps Gain=128	√	34SEG*4COM	1 UART, 1 I²C, 1SPI	RTC, 1 BUZ, 2 PWM/PDM, 2 OP, 1 DAC	LQFP64

HART调制解调器芯片 | HART Modem IC

型号	工作电压	工作电流@3.3V	时钟频率	兼容	封装
Part Number	Operating Voltage	Operating Current	Clock Frequency	Compatible	Package
SD2017B	2.7~5.5V	150μA（晶振时钟 with crystal oscillator）	3.6864MHz	A5191HRT/HT2015/SD2015	LQFP32
SD2057	2.7~5.5V	97μA（外灌时钟 with External clock input）	3.6864MHz	AD5700	QFN24
SD2085	2.7~3.6V	97μA（外灌时钟 with External clock input）	3.6864MHz	DS8500	QFN20

4-20mA DAC芯片 | 4-20mA DAC IC

型号	工作电压	工作电流@5V	分辨率	积分非线性（INL）	兼容	封装
Part Number	Operating Voltage	Operating Current	Resolution	Integral Nonlinearity (INL)	Compatible	Package
SD2421A	3.0~5.0V	520μA（max）	16bits	±0.01%FS (max)	AD421	SOIC16（W）

信号调理及变送芯片| Signal Processing and Transducing IC

型号	工作电压	工作电流	MTP/OTP	SRAM	E2PROM	PADC ENOB	TADC ENOB	DAC	通信接口	JTAG	IO	封装
Part Number	Operating Voltage	Operating Current							Communication Port			Package
SD23M101	高压模式 (High voltage mode) 6.5~40V	2.5mA	32k Bytes (MTP)	2k Bytes	512 Bytes	20.4bits@10sps Gain = 128	22.1bits@10sps Gain = 1	分辨率：16Bits Resolution：16Bits INL： 0.01% FSR	UART, I2C, SPI, OWI	√	6	QFN32
SD23M201	低压模式 (Low voltage mode) 4.5~5.5V	2.5mA	32k Bytes (MTP)	2k Bytes	512 Bytes	20.4bits@10sps Gain = 128	22.1bits@10sps Gain = 1	分辨率：16Bits Resolution：16Bits INL： 0.01% FSR	UART, I2C, SPI, OWI	/	9	QFN32
SD23P102	2.4~3.6V	1.2mA	16k Bytes (OTP)	512 Bytes	/	17.8bits@4sps Gain = 128	/	/	UART, PWM	/	8	QFN20
SD23P202	2.4~3.6V	1.2mA	16k Bytes (OTP)	512 Bytes	/	17.8bits@4sps Gain = 128	/	/	UART, PWM	/	28	QFN40

数显仪表芯片 | Digital Display Instrument IC

类别 Category	型号 Part Number	Counts	精度 Precision	电压 Voltage	电流 Current	其他功能 Other	报警 Alarm	通信 Communication	变送 Transmit	封装 Package	备注 Remark
LCD表头专用芯片 LCD Voltmeter/Ammeter IC	SD3102F1	29999	0.5%	AC/DC：200mV-1000V	AC/DC：20μA-20A	支持互感器、分流器； 支持在线校准、滤波设置、信号放大、零位调整等 Support transformer and shunt; Support online calibration, filter, amplifier, zero adjustment…	/	/	/	SSOP28	
LED表头专用芯片 LED Voltmeter/Ammeter IC	SD3102F2	29999	0.5%	AC/DC：200mV-1000V	AC/DC：20μA-20A		/	/	/	SSOP28	
单相LED通信表 Single-phase LED Communication Meter	SD3302F1	9999	0.5%	AC/DC：200mV-1000V	AC/DC：20μA-20A		2	Modbus_RTU	4-20mA	LQFP32	变送与报警复用 Transmit and Alarm multiplex
	SD3501F1	29999	0.5%	AC/DC：200mV-1000V	AC/DC：20μA-20A		4	Modbus_RTU	4-20mA	LQFP64	
自动挡电压表 Autorange Voltmeter	SD7501F1	29999	0.5%	AC/DC：0mV-1000V	/		4	Modbus_RTU	4-20mA	LQFP64	
三相LED通信表 Three-phase LED Communication Meter	SD3101F4	9999	0.5%	AC/DC：200mV-500V	AC/DC：20μA-20A	支持互感器、分流器； 支持在线校准、滤波设置、零位调整、亮度调整等 Support transformer and shunt; Support online calibration, filter, zero adjustment, brightness adjustment…	/	Modbus_RTU	/	SSOP24	
	SD3501F2	9999	0.5%	AC/DC：200mV-500V	AC/DC：20μA-20A		2	Modbus_RTU	4-20mA	LQFP64	
4-20mA无源表 4-20mA Loop Meter	SD23P202T4	99999	0.05%	/	DC :3~30mA	小信号切除、有源迁移、零满屏蔽、极性反转等 Small signal removal, active migration, zero full shield, polarity swap…	2	Modbus_RTU	/	QFN40	3051/2088 表头 3051/2088 Meter
	SD3102T4	9999	0.05%	/	DC :3~30mA	电流值显示、显示范围设定等 Current value display, display range setting…	2	/	/	SSOP28	赫斯曼表头 Hersman Meter
	SD7501T4	9999	0.05%	/	DC:3~30mA	/	2	/	/	LQFP64	
	SD7501T5	39999	0.05%	/	DC :3~30mA	/	2	/	/	LQFP64	
超低功耗温度表头 Low-power Temperature Meter	SD23P202T1	9999	0.1℃	PT100/1000	/	分度号选择、低压检测、低功耗模式、背光等 Graduation number, low voltage detection, low power mode, backlight…	/	Modbus_RTU	/	QFN40	就地显示温度表 Temperature Meter
交直流表头芯片 AC/DC Meter IC	SD3101F1	29999	0.5%	AC/DC：200mV-1000V	AC/DC：20μA-20A	数字校准、真有效值测量、滤波设置、放大器、LDO电源输出等 Digital calibration, T-RMS measurement, filter, amplifier, LDO output…	/	Modbus_RTU	/	SSOP24	交直流测量共用电路 AC and DC switchable

计量仪表及万用表芯片 | Digital Multimeter IC

类别 Category	型号 Part Number	自动/手动 Auto or Manual	Counts	电压 Voltage	电流 Current	电阻 Resistor	电容 Capacitor	频率 frequency	二极管 Diode	三极管 Triode	占空比 Duty Cycle	脉冲 Pulse	温度 Temperature	NCV	封装 Package
2000分度万用表 2000 Counts Digital Multimeter	SD7830M-1	手动 Manual	2000	DC :199.9mV~1010V AC :1.999V~760V	DC: 19.99μA~10.01A AC: 1.999mA~10.01A	199.9Ω~199.9MΩ	/	/	0.000~1.999V	0~1999hFE	/	/	℃/°F	0~4级 （Level）	裸片 DIE
	SD7208	手动 Manual	2000	DC :199.9mV~1010V AC :199.9mV~760V	DC: 19.99uA~19.99A AC: 1.999mA~19.99A	199.9Ω~199.9MΩ	1.999nF~199.9μF	1.999kHz/199.9kHz	0.000~1.999V	0~1999hFE	/	/	℃/°F	LIVE	裸片 DIE
	SD7835-M2	手动 Manual	2000	DC :199.9mV~1010V AC :199.9mV~760V	DC: 19.99μA~19.99A AC: 1.999mA~19.99A	199.9Ω~199.9MΩ	1.999nF~1.999mF	1.999Hz~1.999MHz	0.000~1.999V	0~1999hFE	/	√	℃/°F	0~4级 （Level）	裸片 DIE
	SD7830A-1	自动 Auto	2000	DC :199.9mV~1010V AC :1.999V~760V	DC: 199.9μA~10.01A AC: 199.9μA~10.01A	199.9Ω~199.9kΩ/ 1.999kΩ~19.99MΩ	/	/	0.000~1.999V	0~1999hFE	/	/	℃/°F	0~4级 （Level）	裸片 DIE
4000分度万用表 4000 Counts Digital Multimeter	SD7835-M1	手动 Manual	4000	DC: 400.0mV~1010V AC: 400.0mV~760V	DC: 40.00μA~20.00A AC: 4.000mA~20.00A	400.0Ω~200.0MΩ	4.000nF~400.0μF	9.999Hz~9.999MHz	0.000~1.999V	0~1999hFE	/	/	℃/°F	0~4级 （Level）	裸片 DIE
	SD7835-A1	自动 Auto	4000	DC: 400.0mV~1010V AC: 4.000V~760V	DC: 400.0μA~20.10A AC: 400.0μA~20.10A	400.0Ω~40.00MΩ	4.000nF~4.000mF	4.000Hz~4.000MHz	0.000~1.999V	0~1999hFE	/	/	℃/°F	0~4级 （Level）	裸片 DIE
	SD7821-1	自动 Auto	4000	DC: 400.0mV~1000V AC: 400.0mV~750V	DC: 400.0μA~10.00A AC: 400.0μA~10.00A	400.0Ω~40.00MΩ	4.000nF~200.0μF	9.999Hz~4.999MHz	0.000~3.300V	0~1999hFE	1~99%	/	℃/°F	/	裸片 DIE
6000分度万用表 6000 Counts Digital Multimeter	SD7890-M1	手动 Manual	2000/ 4000/ 6000	DC: 600.0mV~1010V AC: 6.000V~760V	DC: 60.00μA~10.10A AC: 6.000mA~10.10A	600.0Ω~200.0MΩ	6.000nF~100.0mF	9.999Hz~9.999MHz	0.000~3.300V	0~1999hFE	1~99%	√	℃/°F	0~4级 （Level）	裸片 DIE
	SD7890-A1	自动 Auto	4000/ 6000	DC: 600.0mV~1010V AC: 600.0mV~760V	DC: 600.0μA~20.00A AC: 600.0μA~20.00A	600.0Ω~60.00MΩ	6.000nF~60.00mF	9.999Hz~9.999MHz	0.000~3.300V	0~1999hFE	1~99%	√	℃/°F	0~4级 （Level）	裸片 DIE
	SD7890-A2	自动 Auto	4000/ 6000	DC: 600.0mV~1010V AC: 600.0mV~760V	DC: 60A~2000A AC: 6A~2000A	600.0Ω~60.00MΩ	6.000nF~6.000mF	9.999Hz~9.999MHz	0.000~3.300V	/	1~99%	/	℃/°F	0~4级 （Level）	裸片 DIE

计量仪表及万用表的SoC | Digital Multimeter SoC

型号 Part Number	自动/手动 Auto or Manual	Counts	电压 Voltage	电流 Current	电阻 Resistor	二极管 Diode	电容 Capacitor	频率 frequency	占空比 Duty Cycle	三极管 Triode	温度 Temperature	NCV	峰值保持 Peak Hold	浪涌测量 Surge Measurement	封装 Package
SD7830M	手动 Manual	2000	√	√	√	√	√	√	/	√	√	√	/	/	裸片DIE
SD7830A	自动 Auto	2000	√	√	√	√	√	√	/	√	√	√	/	/	裸片DIE
SD7835		4000	√	√	√	√	√	√	/	√	√	√	/	/	裸片DIE
SD7821		4000	√	√	√	√	√	√	√	√	√	√	/	/	裸片DIE
SD7890		6000	√	√	√	√	√	√	√	√	√	√	/	/	裸片DIE
SD7500		4000	√	√	√	√	√	√		√	√	√	/	/	LQFP44
SD7501		6000	√	√	√	√	√	√	√	√	√	√	/	/	LQFP64
SD7502		9999	√	√	√	√	√	√	√	√	√	√	√	√	LQFP64

红外感应（PIR）芯片 | Pyroelectric Infrared Sensing Controller IC

型号 Part Number	功能 Function	工作电压 Operating Voltage	工作电流 Operating Current	模拟输入通道 Analog Interface	输出延时设置 Output Delay Setting	封装 Package
SD4101R-1	热释电红外感应芯片 Pyroelectric Infrared Sensing Controller IC	2.8~3.6V	400μA	4路（channel）	1~600秒	SOP8

型号 Part Number	功能 Function	工作电压 Operating Voltage	工作电流 Operating Current	OTP	SRAM	ADC ENOB	外设 Peripherals	应用领域 Application Area	封装 Package
SD4101	带 PWM 输出与高精度 ADC 的 SoC SoC with PWM output and high precision ADC	2.4~3.6V	500μA	4k Bytes	256 Bytes	20.6bits@250sps Gain = 1	PWM	PIR, NCV…	SOP8
SD4102	带 PWM 输出多路ADC 应用 SoC SoC with PWM output multi-channel ADC	2.4~3.6V	500μA	4k Bytes	256 Bytes	20.6bits@250sps Gain = 1	PWM	PIR, NCV…	SOP14

数字温度传感器芯片 | Digital Temperature Sensor IC

型号 Part Number	工作电压 Operating Voltage	工作电流 Operating Current	休眠电流 Sleeping Current	温度测量范围 Temperature Measurement Range	典型误差@3.0V Typical Error @3.0V	兼容 Compatible	封装 Package
SD5020A	2.7~5.5V	170μA	<1μA	-55~+125℃	±0.8℃@-10~+85℃ ±1.5℃@-55~+125℃	DS18B20	TO-92
SD5003A/B	2.7~5.5V	170μA	<1μA	-55~+125℃	±1.5℃@-40~+100℃ ±2.0℃@-55~+125℃	TMP03	TO-92/SOP8
SD5075	2.7~5.5V	170μA	<1μA	-55~+125℃	±0.5℃@-40~+100℃ ±1.0℃@-55~+125℃	ADT75, LM75A, TMP75	SOP8
SD5820A	2.7~5.5V	170μA	<1μA	-55~+125℃	±0.5℃@-10~+85℃ ±0.8℃@-55~+125℃	DS18B20	TO-92