SS809 Brief Datasheet

8-bit Low Power Microcontroller With Integrated Charge and Discharge Management

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SS809

8-bit Low Power Microcontroller With

Integrated Charge and Discharge Management

Features

- Enhanced 8-bit MCU compatible with 8051 instruction set
  - Maximum frequency is 12Mhz
  - Single clock instruction cycle
- Program storage space (OTP): 6KB/12KB, programmed with 1KB unit, and can be programmed up to 12 times
- Data storage space(RAM): 192B
- working voltage: 2.8 - 5.5V
- Oscillator:
  - Low speed RC oscillator(LORC), 32KHz
  - High speed RC oscillator(HIRC), 12MHz
  - 4-gear center frequency point programmable, frequency adjustable RC oscillator PRC, multiplexed I / O port to output frequency
- Support battery or adapter power supply
- Built in linear charging management unit
  - Can charge single lithium battery, lithium iron phosphate battery, nickel hydrogen battery, etc.
  - Charging voltage and charging current are fine and adjustable.
  - Maximum charging current is 800mA
- Power supply pin (VIN) supports up to 14V withstand voltage
- Ultra low power consumption
  - Support Normal, Low speed, Idle, Stop and Standby modes
- Support 6 reset modes: Power on, External pin, Watchdog timer, VCC low voltage, Debugger and Software exception
- Integrated 12 bit 8-channel wide voltage ADC

  - Two channels support high gain mode, which can be used in current, micro voltage and other measurement scenarios
- Integrated analog comparator
- Integrated gear-programmable VCC low voltage detection module
- Integrated VIN overvoltage/overcurrent protection module
- Integrated system over temperature detection and protection module
- Integrated analog key detection function

- 2 16 bit timers / counters

  - Support PWM mode and provide two general PWM outputs
  - Support hardware breathing LEDs mode
- 1 13 bit timer
  - Up to 4 channels of comparison output are supported at the same time (4 channels of smart PWM with the same frequency and different duty cycle can be generated)
  - -Support up to 4 capture inputs at the same time
- 1 watchdog timer, which can be used to reset the system or wake up the system from low power consumption mode

- supports up to 13 bi-directional I / O ports

  - The output of 8 I / OS is push-pull mode, and the other 5 can be configured as push-pull or open drain modes.
  - All I / O can be configured as pull up or pull down
  - 5 I / OS support high current drive
- Support 2-way general PWM output
- Support four smart PWM outputs with the same frequency
  - High precision regulation of duty cycle
  - Support multiple bound outputs to improve drive capability
  - Support dead zone control
- Support up to 2 hardware control interfaces for breathing LEDs
- Support up to 2 external interrupts, which can be configured as up edge, down edge, high level and low level trigger modes
- Integrate 1 I2C interface and 1 UART interface
- Integrated segment LCD controller
- Integrated serial dispatch port, supporting cascade control
- Support two-wire debugging/burning interface

1. Product Brief

SS809 is an AD MCU integrated with charge and discharge management. It has rich interface functions, flexible configuration mode and different low power consumption options. This product is mainly used in portable electronic devices that need charging and intelligent control, which brings simplified peripheral cost, excellent performance and convenient development. Typical application products, such as Bluetooth headset charging box, LED light group, hand-held atomizer, personal care equipment, electronic cigarette, aromatherapy machine, aromatherapy lamp, electronic toys, etc.

SS809 has built-in 8-bit MCU compatible with 8051 instruction set, with the highest frequency of 12Mhz. Optimized to execute most 1-byte instructions in a single clock cycle.

The SOC chip of the single-chip microcomputer contains abundant peripherals, up to 13 bidirectional I / O ports (part of which supports high current drive), 2 external interrupt eint0/1, 12 bit 8-channel differential ADC, 2 analog comparators, 1 UART, 1 I2C, 1 SCOM interface for driving and controlling the segment display screen, 1 serial dispatching port supporting cascade control, 1 programmable frequency output unit and 1 two-wire debugging/burning interface.

It contains two 16 bit timers / counters compatible with 8051 chip, which can independently output two PWM signals with adjustable cycle and duty cycle (which can be configured as breathing LED mode controlled by hardware). It also includes a 13 bit timer, which supports automatic re-load, supports up to 4 channels of comparison output or acquisition input, and can output 4 channels of PWM signals with the same frequency and different duty cycle at the same time.

It supports normal, low-speed, idle, stop and sleep modes, and provides a variety of low-power options at the same time of high performance to support battery powered devices and scenes.

Built in 192 bytes RAM, 6K/12K bytes OTP ROM (programmed with 1KB unit, and can be programmed up to 12 times).

SS809 also integrates the power management unit and charging management unit, which supports the power supply of batteries or 5V adapters, and supports the charging of batteries with different specifications and capacities. Combined with the built-in detection and protection mechanism of low voltage, over voltage, over current and over temperature, it can provide an efficient and safe power supply solution.

1.1. Pin Description

SS809 has 16 Pins：

- Including power supply pin, GPIO port, ADC and other analog functions, PWM and other digital functions
- Most pins have multiple functions, which can be selected through MFP registers

The pin diagram is as follows (refer to the following table for detailed pin description):

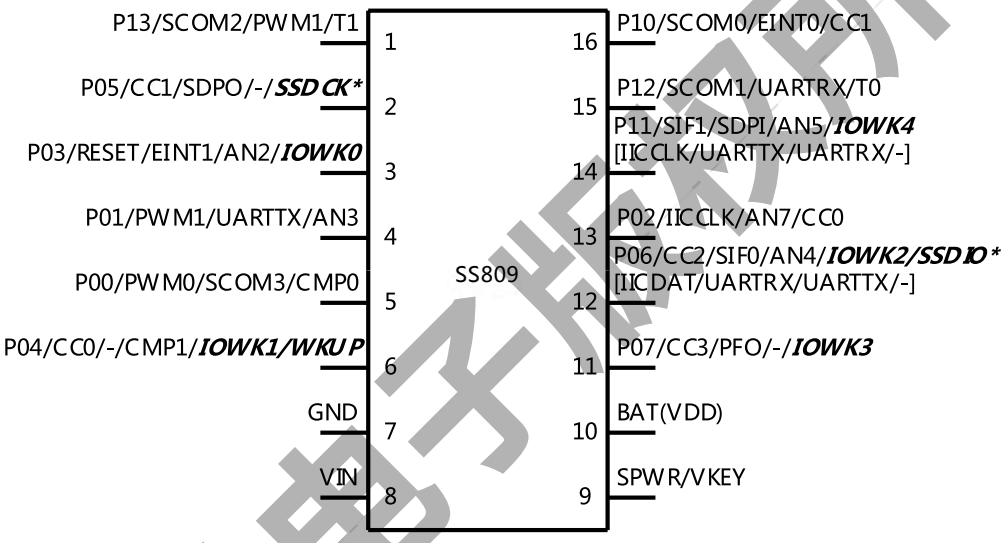


Figure 1 SS809 pin diagram

Table 1 SS809 (SOP16) Pin description

Name	Number	Function					
		F0	F1	F2	F3	EXT0	EXT1
P00	5	P00	PWM0	SCOM3	CMP0	-	-
P01	4	P01	PWM1	UARTTX	AN3	-	-
P02	13	P02	IICCLK	AN7	CC0	-	-
P03	3	P03	RESET	EINT1	AN2	Stop wakeup (IOWK0)	-
P04	6	P04	CC0	-	CMP1	Stop wakeup (IOWK1)	
P05	2	P05	CC1	SDPO	-	-	SSDCK

P06	12	P06	CC2	SIF0	AN4	Stop wakeup (IOWK2)	SSDIO
		IICDAT	*UARTRX*	*UARTTX*	-		
P07	11	P07	CC3	PFO	-	Stop wakeup (IOWK3)	-
P10	16	P10	SCOM0	EINT0	CC1	-	-
P11	14	P11	SIF1	SDPI	AN5	Stop wakeup (IOWK4)	-
		IICCLK	*UARTTX*	*UARTRX*	-		
P12	15	P12	SCOM1	UARTRX	T0	-	-
P13	1	P13	SCOM2	PWM0	T1	-	-
VIN	8	-	-	-	-	DC5V	-
SPWR/ VKEY	9	-	-	-	-	供电输入/输出	模拟按键
BAT	10	-	-	-	-	Battery/ Power supply	-
GND	7	-	-	-	-	GND	-

1.2. Block diagram

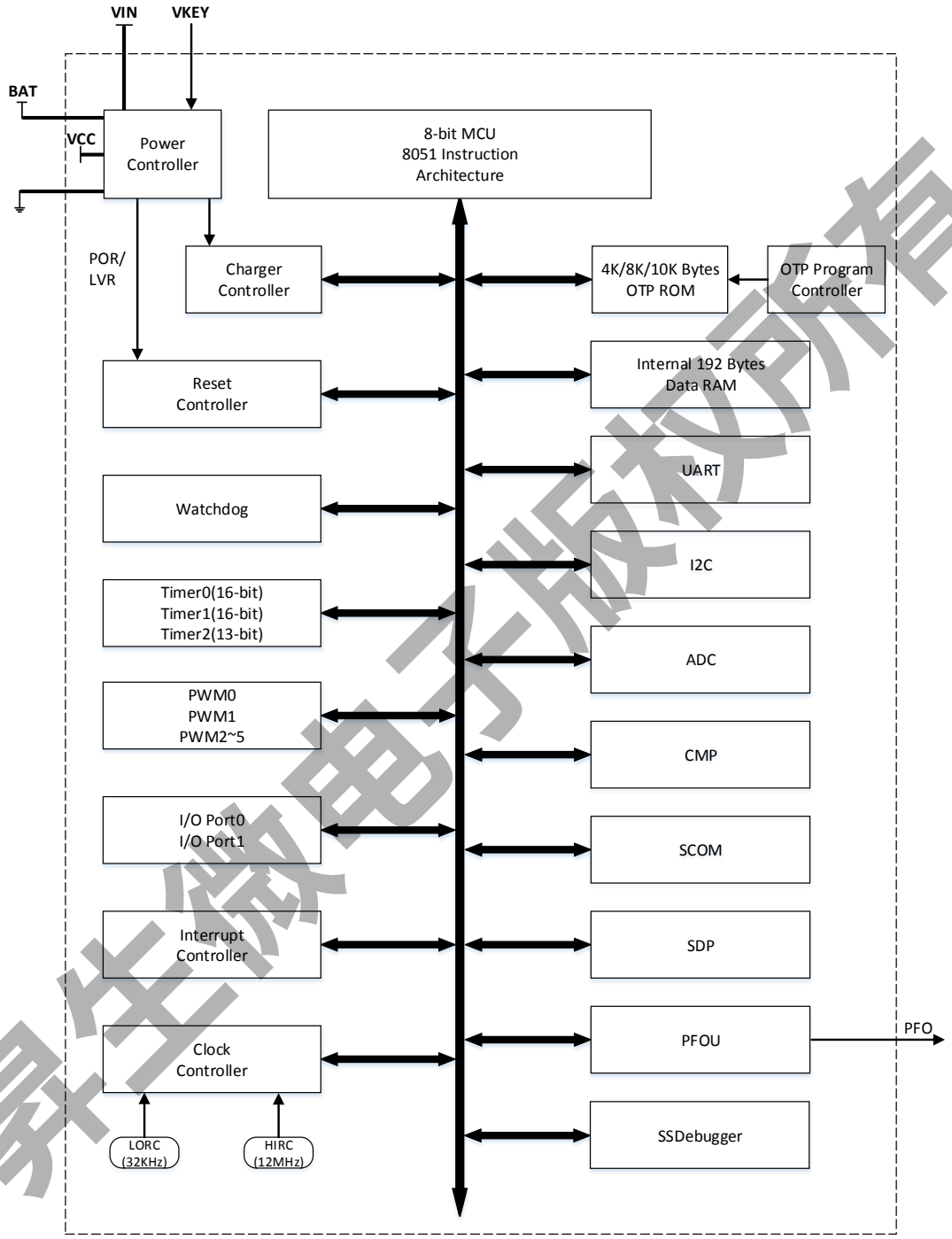
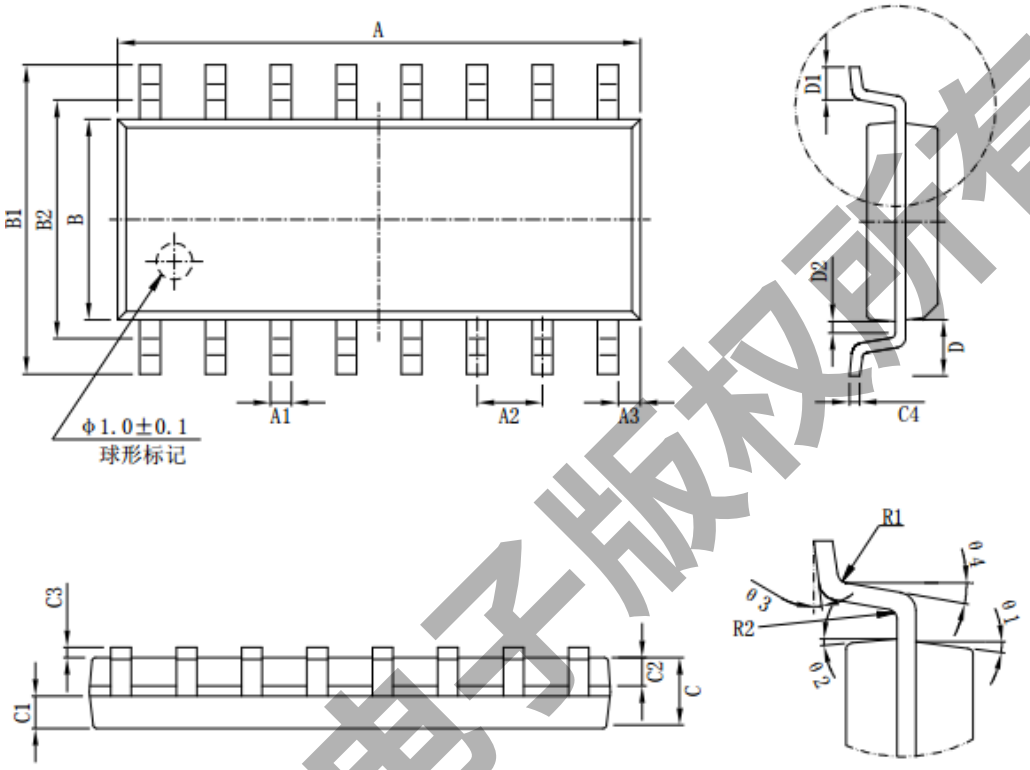


Figure 2 SS809 Block diagram

1.3. Ordering Information

Product model	Package type	Package size
SS809	SOP16	9.9x3.9x1.5mm



标注 尺寸	最小(mm)	最大(mm)	标注 尺寸	最小(mm)	最大(mm)
A	9.80	10.00	C4	0.203	0.233
A1	0.356	0.456	D	1.05TYP	
A2	1.27TYP		D1	0.40	0.70
A3	0.302TYP		D2	0.15	0.25
B	3.85	3.95	R1	0.20TYP	
B1	5.84	6.24	R2	0.20TYP	
B2	5.00TYP		θ1	8° ~ 12° TYP4	
C	1.40	1.60	θ2	8° ~ 12° TYP4	
C1	0.61	0.71	θ3	0° ~ 8°	
C2	0.54	0.64	θ4	4° ~ 12°	
C3	0.05	0.25			

2. Electrical Characteristics

2.1. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input voltage	VIN	-0.3 ~ 14	V
	BAT	-0.3~7	V
	SPWR/VKEY	-0.3~7	V
Junction Temperature	T_J	-40 ~ 150	℃
Storage Temperature	Tstg	-60 ~ 150	℃
Working Temperature	T_A	-40~85	℃
ESD(HBM)	ESD	4	KV

* Stresses higher than those listed in the absolute maximum rating section can cause permanent damage to the device

2.2. Recommended working conditions

Parameter	Symbol	Min	典型值	Max	Unit
Input Voltage	VIN	4.5	5	5.5	V
	BAT	2.7	3.7	4.35	V
	SPWR/VKEY	4.5	5	5.5	V
Working Temperature	T_A	-10		70	℃

* Beyond these operating conditions, the operating characteristics of the device cannot be guaranteed

Change Log

2018-08-10	Rev 1.0	Create
2020-04-09	Rev 1.1	Add the description of the second level multiplexing of P06 and P11
2020-06-28	Rev 2.2	Remove EINT0 function from P04

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