ams AS8512
Datasheet

ams OSRAM

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AS8512 Battery pack current, voltage and temperature sensor

1 General description

The AS8512 is a virtually offset free, low noise, two channel measurement device. It is tailored to accurately measure battery current from mA range up to kA range in conjunction with a 100 µΩ shunt resistor in series with the battery rail. Through the second measurement channel it enables capture of, either battery voltage synchronous with the current measurement, or, measure the analog output of an internal or external temperature sensor. Both channels are matched and can either measure small signals up to ±160 mV versus ground, through programmable gain amplifier or larger signals in the 0 to 1V range without the amplifier.

After analog to digital conversion and filtering, the resulting 16-bit data is accessible via 4-wire standard serial interface (SPI).

1.1 Key benefits & features

The benefits and features of AS8512 are listed below:

Table 1: Added value of using AS8512

Benefits	Features
• Low supply voltage	• 3.3V supply voltage
• Redundant measurement possibility	• Two high resolution 16-bit Σ−Δ A/D converters
• Flexible configuration	• Programmable sampling to enable data throughputs from less than 1Hz to 8kHz
• Unique measurement principle	• Zero offset for both channels

- Precision, low noise, programmable gain amplifiers for both channels with gains 5, 25, 40, 100 to support wide dynamic ranges.
- Option for multiplexing either one differential input, or two single ended inputs or the internal temperature sensor on one channel.
- Programmable current source for external temperature sensor connectable to any of the inputs.
- High precision and high stability 1.2V reference voltage source.
- Digital signal processing with filter options for both channels.
- Four operating modes providing

- Continuous data acquisition (or)
- Periodic single-shot acquisition, (or)
- Continuous acquisition on threshold crossing of programmed current levels (or)
- A combination of the above
- On chip high-precision 4MHz RC oscillator or option for external clock.
- -40ºC to 105ºC ambient operation.
- Chip ID feature
- SSOP-20 pin package.

1.2   Applications

The AS8512 is ideal for shunt based batteries sensor - Battery pack current, voltage & temperature measurement.

1.3   Block diagram

Figure 1: AS8512 block diagram
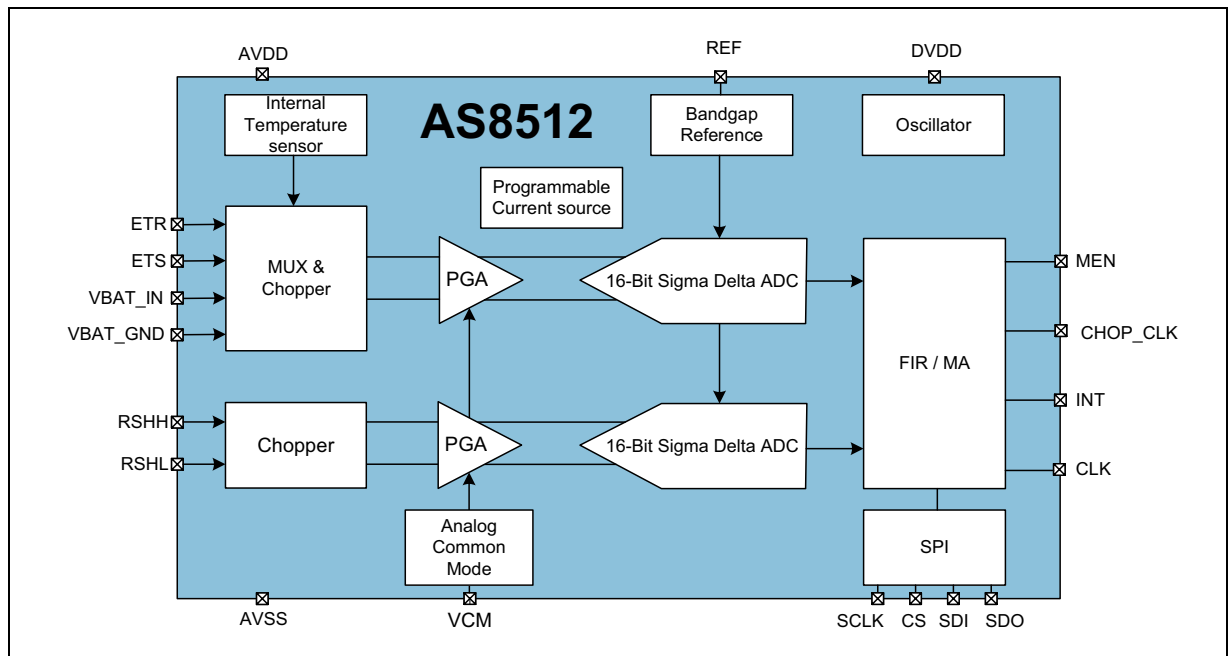
2   Ordering information

Ordering code	Description	Delivery form	Package
AS8512-ZSSP	Data acquisition device for battery sensors	Tape and reel (2000 pcs)	20-pin SSOP
AS8512-ZSSM	Data acquisition device for battery sensors	Tape and reel (500 pcs)	20-pin SSOP

3 Pin assignments

Figure 2: Pin assignment of AS8512 (Top View)
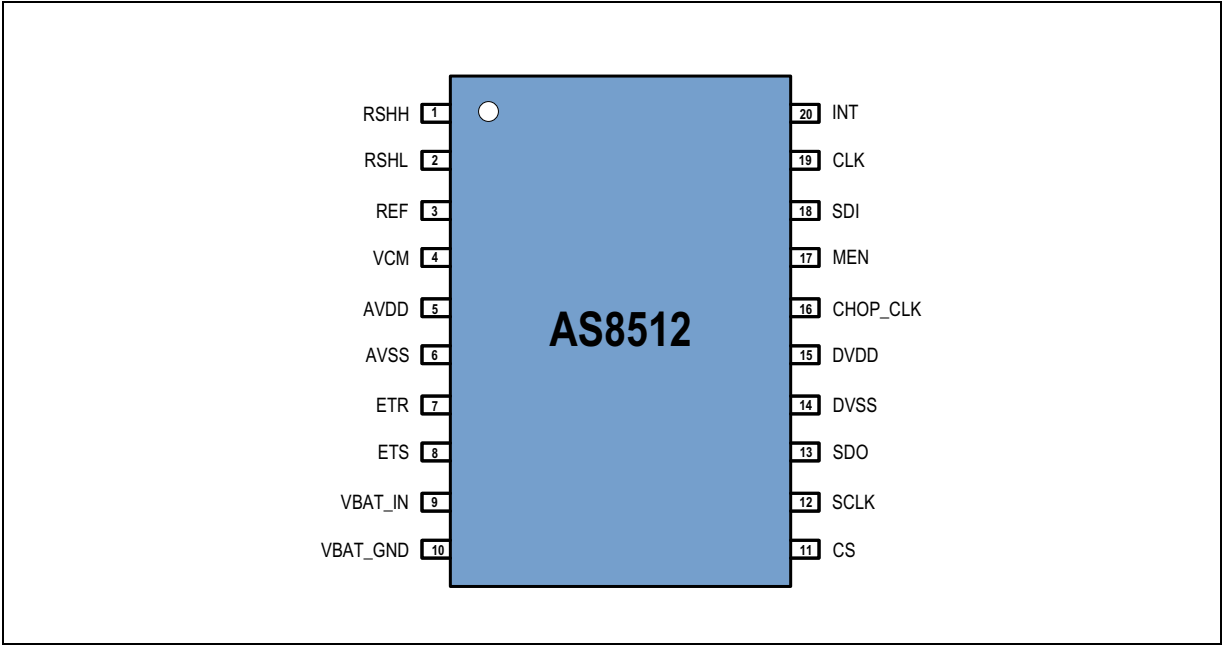
3.1 Pin descriptions

Table 2: Pin description of AS8512

Pin number	Pin name	Pin type	Description
1	RSHH	Analog input	Positive differential input for current channel
2	RSHL		Negative differential input for current channel
3	REF	Analog output	Internal reference voltage to sigma-delta ADC; connect 100nF to AVSS from this pin.
4	VCM		Common mode voltage to the internal measurement path; connect 100nF to AVSS from this pin.
5	AVDD	Supply pad	+3.3V analog power-supply
6	AVSS		0V power-supply analog

Pin number	Pin name	Pin type	Description
7	ETR	Analog input	Voltage channel single ended input
8	ETS		
9	VBAT_IN		Battery voltage (high) input
10	VBAT_GND		Battery voltage (low) input
11	CS	Digital input with pull-up	Chip select with an internal pull-up resistor (SPI Interface)
12	SCLK	Digital input	Clock signal (SPI Interface)
13	SDO	Digital output	Serial data input (SPI Interface)
14	DVSS	Supply pad	0V digital ground
15	DVDD		+3.3V digital supply
16	CHOP_CLK	Digital output	Chop clock used in High side measurements to synchronize external chopper.
17	MEN		Digital output issued during the Standby Mode (SBM) to signal the short duration of data sampling. This signal is useful in the case of a High Side Measurement application.
18	SDI	Digital input	Data signal (SPI Interface)
19	CLK	Digital I/O	By default this pin is the internal clock output which can be used by a microcontroller. The internal clock may also be disabled as an output by programming Register 08. To use an external Clock, Register 08 has to be programmed.
20	INT	Digital output	Active high Interrupt to indicate data is ready

4   Revision information

Document status	Product status	Definition
Product Preview	Pre-Development	Information in this datasheet is based on product ideas in the planning phase of development. All specifications are design goals without any warranty and are subject to change without notice
Preliminary Datasheet	Pre-Production	Information in this datasheet is based on products in the design, validation or qualification phase of development. The performance and parameters shown in this document are preliminary without any warranty and are subject to change without notice
Datasheet	Production	Information in this datasheet is based on products in ramp-up to full production or full production which conform to specifications in accordance with the terms of ams-OSRAM AG standard warranty as given in the General Terms of Trade

Other definitions

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A short datasheet is intended for quick reference only, it is an extract from a full datasheet with the same product number(s) and title. For detailed and full information always see the relevant full datasheet. In case of any inconsistency or conflict with the short datasheet, the full datasheet shall prevail.

Changes to current revision v1-00	Page
This short datasheet is derived from v1-00 of full datasheet	

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.

- Correction of typographical errors is not explicitly mentioned.

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