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Data Sheet

Low power Hall switch SDC1217

Overview

SDC1217 is a high-precision, low-power Hall switch for Unipolar magnetic field detection, giving a corresponding digital output.

The typical power consumption is less than 4uW, so it is very suitable for low-power consumption products.

For battery-powered systems where power consumption is a priority, such as touch-screen mobile phones, Tablets, laptops, etc.

This product has precise magnetic switch switching points and is Low sensitivity to process variations and temperature changes.

Available in small SOT-23-3, TO-92 and DFN-4L sizes.

Features

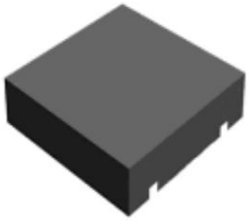
ÿ Extremely low power consumption design ÿ Operating voltage range: 1.65V~5.5V ÿ Output mode: CMOS output ÿ Chopper amplifier design, due to process, operating temperature and mechanical stress Low noise and offset sensitivity ÿ S/N pole use ÿ Package: SOT-23-3, TO-92S, DFN-4L

application

ÿ Touch-screen mobile phones, tablet computers ÿ Laptops, digital cameras ÿToys , game consoles ÿHousehold appliances

TOÿ92S

TODAY-23-3



DFNÿ4L

Figure 1. Package type

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Pin Description

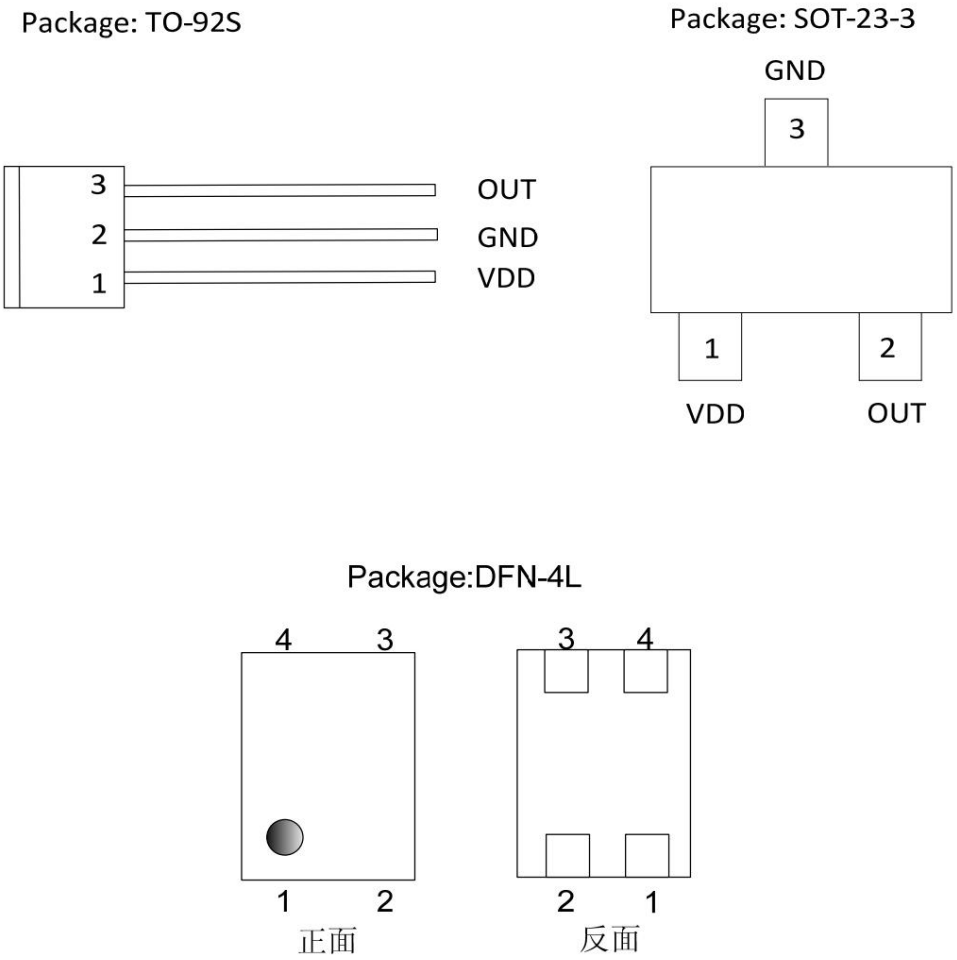

Figure 2. Pin layout

serial number			name	describe
TODAY-23-3	**TOÿ92S**	**DFNÿ4L**		
1	1	4	VDD	power supply
3	2	2	GND	land
2	3	1	OUT	Output
ÿÿÿÿÿ	ÿÿÿÿÿ	3	NC	floating

Table 1. Pin Description

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Functional Block Diagram

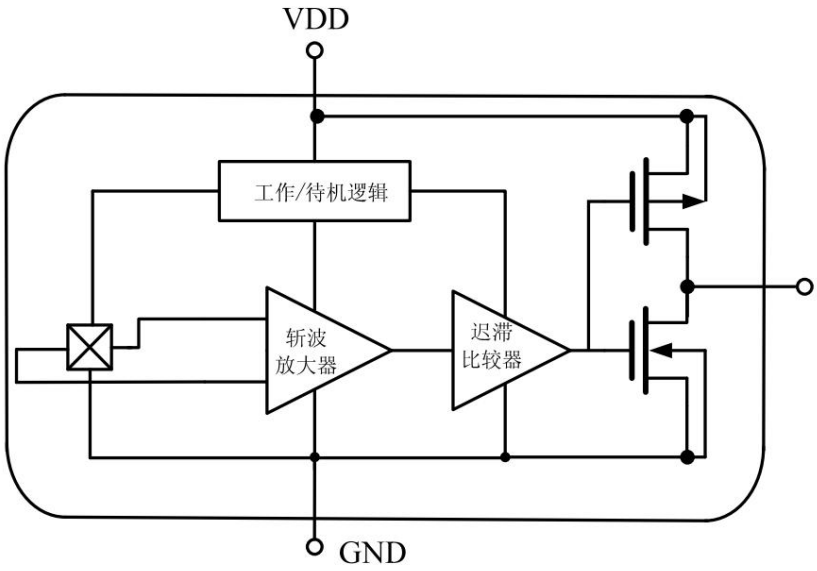

Figure 3. Functional block diagram

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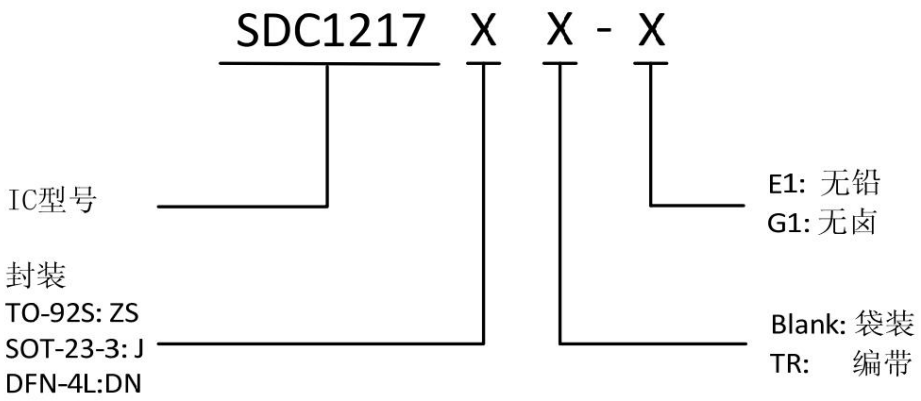
Ordering Information



Package temperature range		Product Number		Identification number		Packaging
		Lead Free	Halogen Free	Lead Free	Halogen Free	
TOÿ92S	ÿ40°C~125°C	SDC1217ZSÿE1	SDC1217ZSÿG1	1217	1217G Bag	
TODAY-23-3		SDC1217JTRÿE1	SDC1217JTRÿG1	1217	1217G Taping	
DFNÿ4L		SDC1217DNTRÿE1	SDC1217DNTRÿG1	1217	1217G Taping	

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Limit parameters (Note: Do not exceed the maximum value in application to prevent damage. Long-term operation at the maximum value may affect the reliability of the device)

Parameter Symbols		condition	Parameter Value	unit
Storage Temperature Range	TS		-40~150	ÿ
DC Supply Voltage Supply	VDD		1.6~6	V
Current Magnetic	IDD		-1.0~2.5	mA
Induction Strength	B		No restrictions	ÿ
Maximum Junction Temperature	TJ		150	ÿ
PIN soldering temperature		10 seconds	<260	ÿ
ESD,HBM model per MilÿStdÿ883H,Method 3015	HBM	–	4000	V
ESD,MM model per JEDEC EIA/JESD22ÿA115	MM	–	400	V
Latchÿup test per JEDEC 78		–	200	mA

Table 2. Limit parameters

Recommended operating conditions

parameters	symbol	Minimum	typical	Maximum	unit
Supply voltage range	VDD	1.65		5.5	V
Output voltage range	VOUT	-0.3		5.5	V
Operating temperature	Facing	-40	25	125	ÿ

Table 3. Recommended operating conditions

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Electrical Characteristics (Unless otherwise specified, VDD=3.3V, Ta=25ÿ)

Parameter Symbol		Test condition	Min	Typ	Max	Unit
static parameters						
Average supply current	IDD			2	4	uA
Operating current	ION			1.5		mA
Standby current	IS			1.5		uA
Output saturation voltage	VSAT	IOUT=2mA		0.1		V
Output leakage current	HAIR	VOUT=5.5V		0.01		uA
Operating time	tON			50		us
Standby time	tOFF			90		ms

Table 4. Electrical characteristics

Characteristic curves

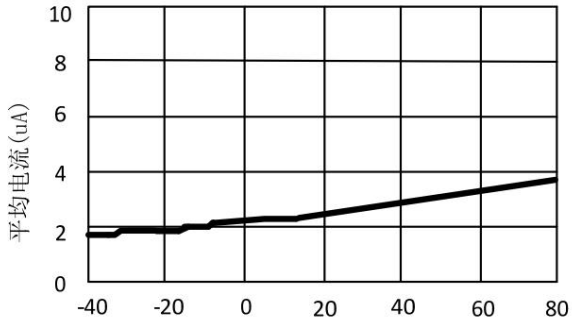

Figure 4. Average current vs. ambient temperature (VDD=3.3V)

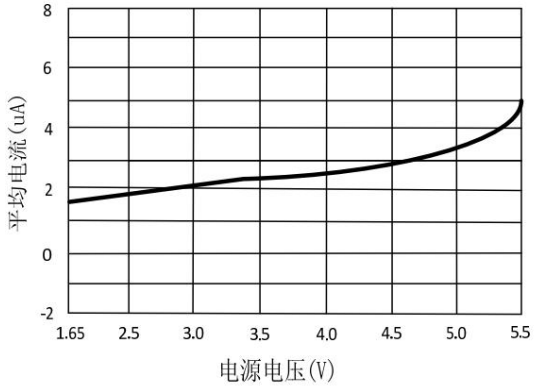

Figure 5. Average current vs. supply voltage (Ta=25ÿ)

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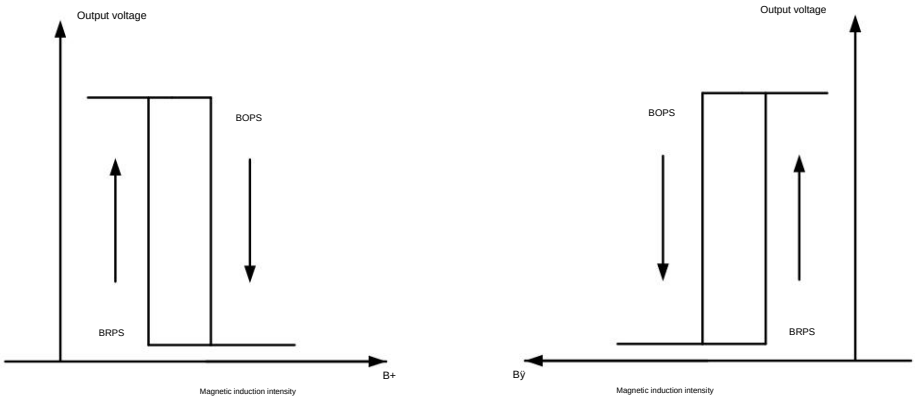
Magnetic field characteristics



TO-92S, DFN package

SOT-23-3 package

Figure 6. Magnetic field characteristics diagram

Magnetic field reversal point

parameters	symbol	condition	Min	Typ	Max	Unit
Hysteresis	BOP			25	30	GS
width of	BRP		10	15		GS
operating point and release point	WHY	BHYS = ÿBOP-BRPÿ		10		GS

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How it works

Power-On Reset

When the power is turned on, the power-on reset circuit immediately resets the digital circuit to bias the circuit

Get proper operation after startup.

Oscillators and Sequencers

The built-in oscillator provides a clock signal to the timing device to determine the working time.

The typical working time is 50us and the standby time is

90ms. In this timing state, its average power consumption is almost equal to the standby power consumption.

It is about 4uW when VDD=1.85V.

Hysteresis control

This module determines the switching threshold of the Hall switch.

Bias circuit provides Hall element, chopper amplifier and hysteresis control

Precise current bias, insensitive to temperature and process variations.

Correct operation and precise switching points can be guaranteed within the range of environmental changes.

Chopper Amplifier

To achieve higher resolution, chopper amplifier is used in the design

It can dynamically remove offsets and interference.

Typical application diagram

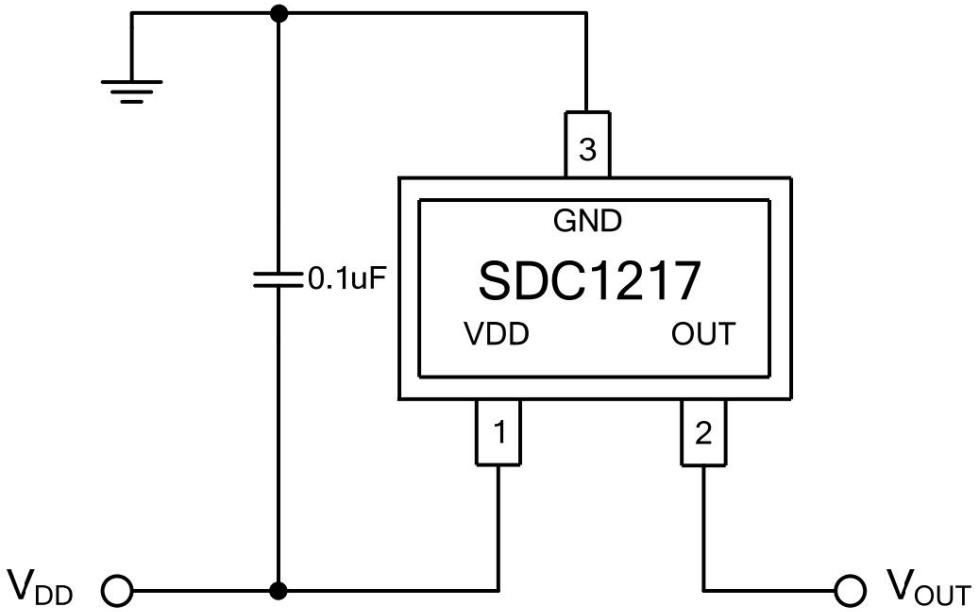

Figure 7. Typical application diagram

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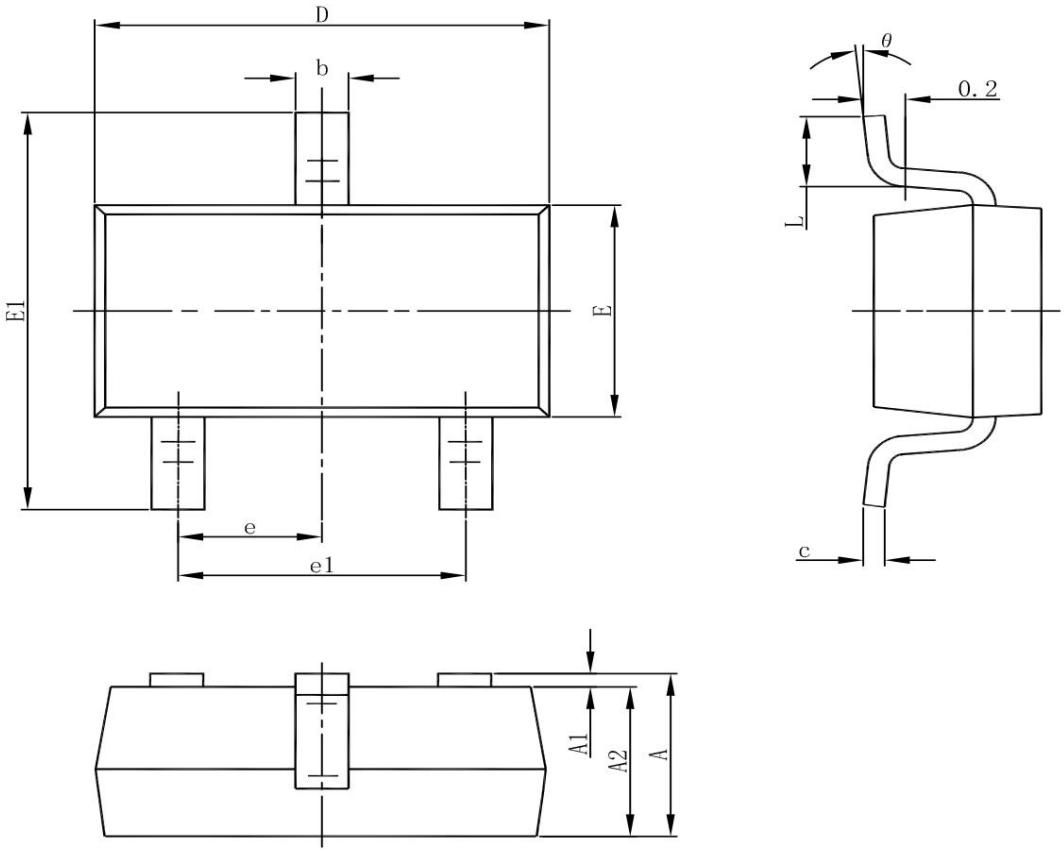
Package size

TODAY-23-3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
ANO	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
and	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
i	0°	8°	0°	8°

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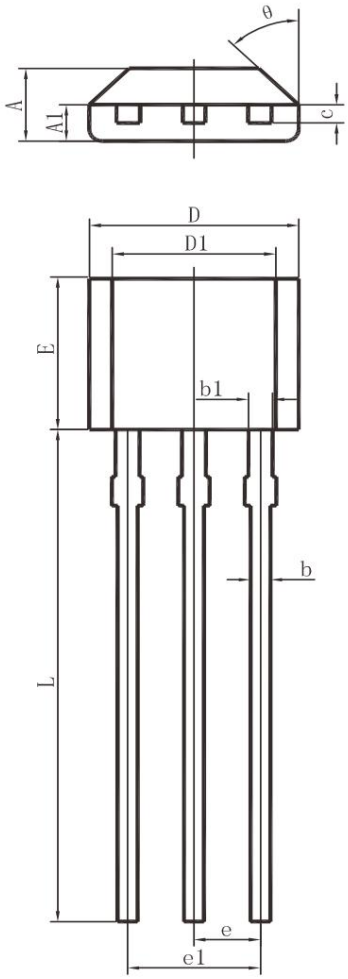
TOÿ92S



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.350	0.480	0.014	0.019
b1	0.380	0.530	0.015	0.021
c	0.360	0.510	0.014	0.020
D	3.900	4.100	0.154	0.161
D1	2.970	3.270	0.117	0.129
AND	2.900	3.100	0.116	0.124
and	1.270 TYPE.		0.050 TYPE.	
e1	2.440	2.640	0.096	0.104
L	14.500	14.900	0.580	0.596
i	45° TYPE.		45° TYPE.	

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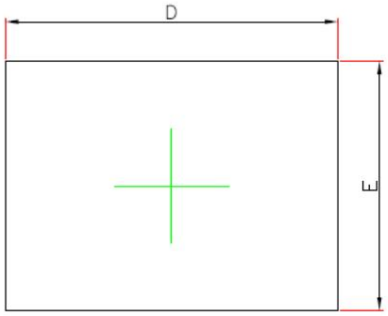
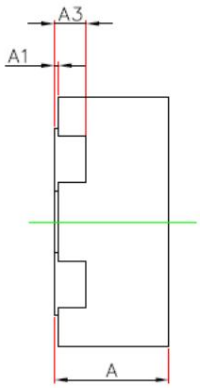
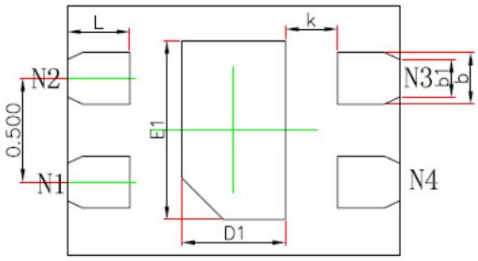


TOP VIEW



SIDE VIEW



BOTTOM VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.500	0.600	0.020	0.024
A1	0.000	0.050	0.000	0.002
A3	0.152REF.		0.006REF.	
D	1.500	1.700	0.059	0.067
E	1.100	1.300	0.043	0.051
D1	0.400	0.600	0.016	0.024
E1	0.760	0.960	0.030	0.038
b	0.200	0.300	0.008	0.012
b1	0.180REF.		0.007REF.	
e	0.500BSC.		0.020BSC.	
L	0.224	0.376	0.009	0.015
k	0.250REF.		0.010REF.	

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