

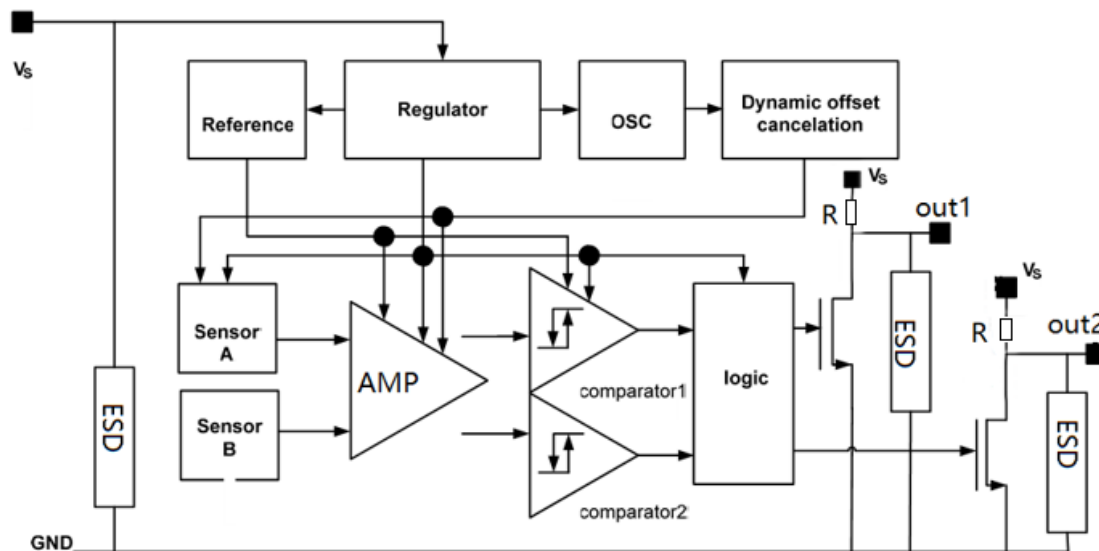
Features and Benefits

- 0.95mm Hall Elements Spacing
- Dual channel and internal pull-up resistor
- High Magnetic Sensitivity: +/-18GS
- Supply Voltage Range: 2.7 ~ 24V
- Specified Operation Temperature Range: -40°C ~ 150°C
- Antistatic ability 4KV HBM

Application Examples

- Magnetic encoder
- Speed detection
- Direction detection
- UAV
- Robots
- Fitness equipment

Functional Block Diagram



General Description

The SS2707D is a dual channel switch Hall sensor with two Hall sensing elements. It outputs two digital signals for speed processing.

The SS2707D internally includes two Hall sensing elements located 0.95mm apart, an on-chip Hall voltage generator, voltage regulator for operation with supply voltage 2.7 to 24V, temperature compensation circuitry,

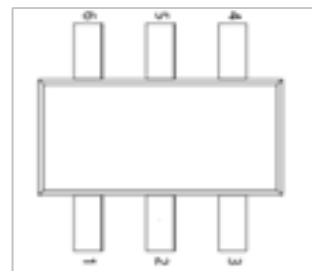
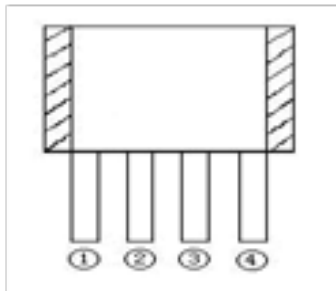
small-signal amplifier, Hall sensor with dynamic offset cancellation system, Schmitt trigger and internal pull-up resistor. Signal processing of speed and signals is easy. The SS2707D provides a variety of packages to customers, flat TO-94 for through-hole mount and SOT-23-6L for surface mount. All packages are RoHS compliant.

Glossary of Terms

MilliTesla (mT), Gauss	Units of magnetic flux density: 1mT = 10 Gauss
RoHS	Restriction of Hazardous Substances
Operating Point (B_{OP})	Magnetic flux density applied on the branded side of the package which turns the output driver ON ($V_{OUT} = V_{DSon}$)
Release Point (B_{RP})	Magnetic flux density applied on the branded side of the package which turns the output driver OFF ($V_{OUT} = \text{high}$)

Pin Definitions and Descriptions

SOT Pin №	SIP Pin №	Name	Function
4	1	V _{DD}	Supply voltage
1	2	OUT1	Output 1
3	3	OUT2	Output 2
5/6	4	GND	Ground



Absolute Maximum Ratings

Parameter	Value	Units
Supply Voltage (V _{CC})	-15 ~ +30	V
Junction Temperature	165	°C
Operating Temperature Range	-40 ~ 150	°C
Storage Temperature Range	-55 ~ 150	°C

Note: Absolute maximum ratings are limiting values to be applied individually, and beyond which the serviceability of the circuit may be impaired. Functional operability is not necessarily implied. Exposure to absolute maximum rating conditions for an extended period of time may affect device reliability.

Operating Temperature Range	Symbol	Value	Units
Temperature Suffix “E”	T _A	-40 to 85	°C
Temperature Suffix “K”	T _A	-40 to 125	°C
Temperature Suffix “L”	T _A	-40 to 150	°C

General Electrical Specifications

DC Operating Parameters $T_A = 25^\circ\text{C}$, $V_{DD} = 12\text{V}$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Voltage	V_{DD}	$T_J < T_J(\text{max})$	2.7	5	24	V
Supply Current	I_{DD}	$B < \text{BRP}$		5.0	10.0	mA
Output Saturation	V_{SON}	$I_{OUT} = 20\text{mA}$, $B > \text{BOP}$		-	0.4	V
Output Leakage Current	I_{OFF}	$B < \text{BRP}$, $V_{OUT} = 24\text{V}$		0.1	1.0	μA
Output Rise Time	T_R	$R_L = 10\text{k}\Omega$, $C_L = 20\text{pF}$		-	1.0	μs
Output Fall Time	T_F	$R_L = 10\text{k}\Omega$, $C_L = 20\text{pF}$		-	1.0	μs
Delay Time 1	T_{D1}			1.4	-	μs
Delay Time 2	T_{D2}			1.0	-	μs
Internal pull-up resistor	R_{PU}		9	12	15	$\text{K}\Omega$
Magnetic Release Point	B_{OP}		5	18	30	Gs
Magnetic Release Point	B_{RP}		-30	-18	-5	Gs
Hysteresis Window	B_{HYST}	$ \text{BOP} - \text{BRP} $		36		Gs
Distance of Hall	D_{IS}		0.90	0.95	1.0	mm

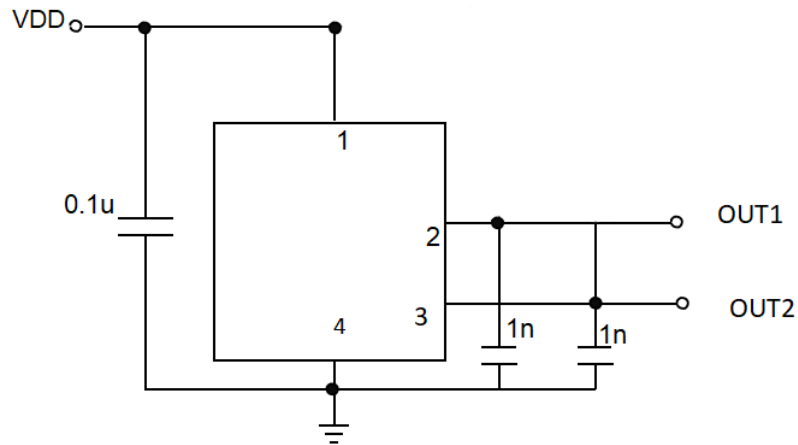
Note: The output of SS2707D will be switched after the supply voltage is over 2.2V, but the magnetic characteristics won't be normal until the supply is over 2.8V.

Magnetic Specifications

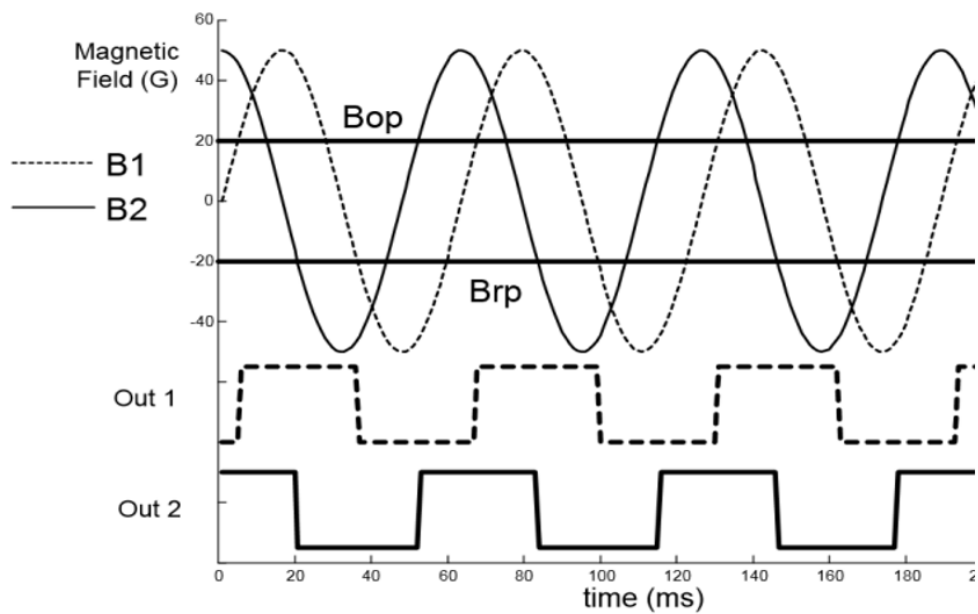
DC Operating Parameters $V_{DD} = 2.8$ to 24V (unless otherwise specified)

Package	Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
UA	Operating Point	B_{OP}	$T_A = 25^\circ\text{C}$ $V_{dd} = 12\text{V DC}$	5	18	30	G
	Release Point	B_{RP}		-30	-18	-5	G
	Hysteresis	B_{HYST}			36		G
SO	Operating Point	B_{OP}	$T_A = 25^\circ\text{C}$ $V_{dd} = 12\text{V DC}$	-30	-18	-5	G
	Release Point	B_{RP}		5	18	30	G
	Hysteresis	B_{HYST}			36		G

Typical Application Circuit

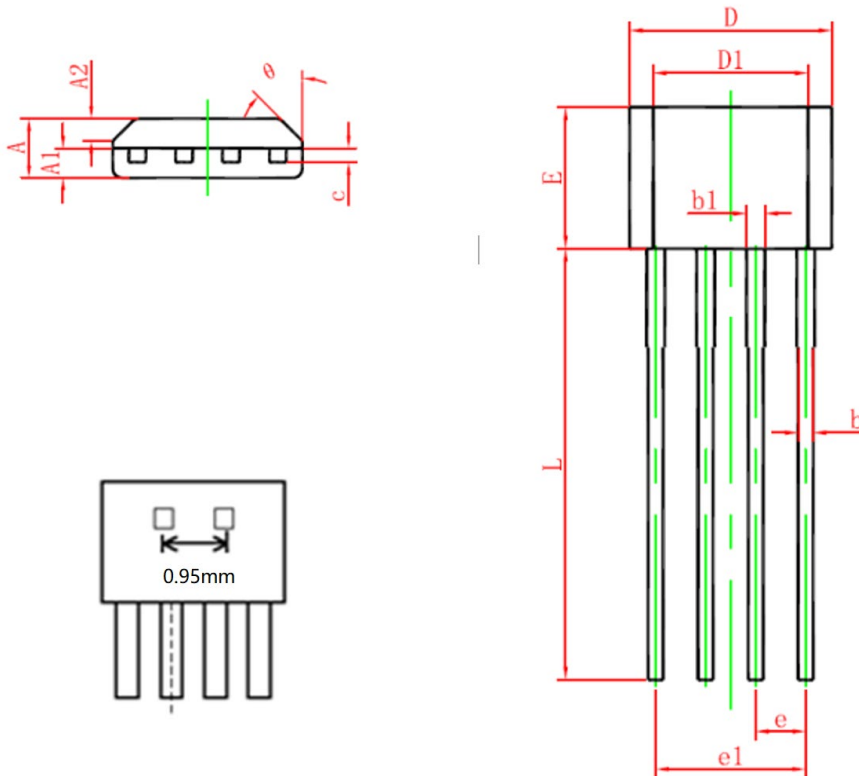


Typical Output waveform



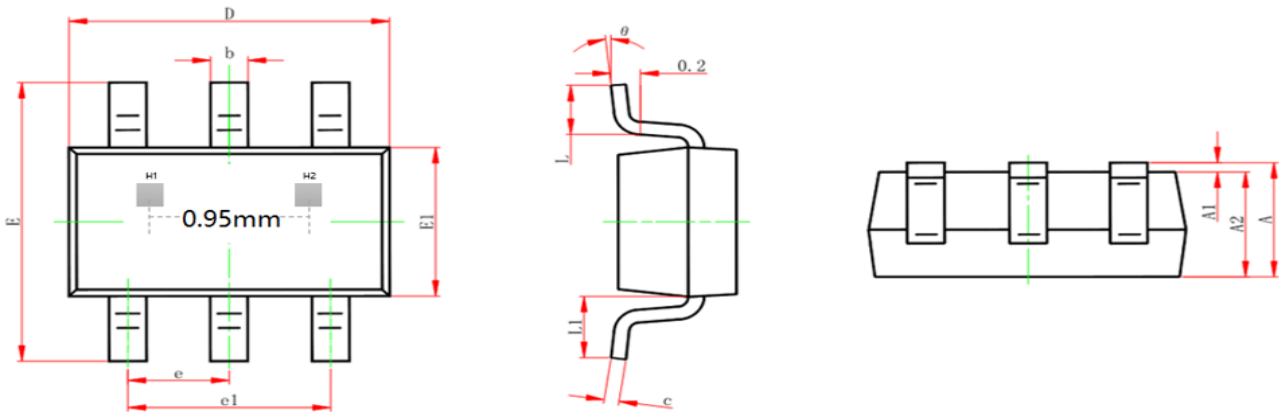
Package Information

Package U4, TO94:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.800	0.055	0.071
A1	0.700	0.900	0.028	0.035
A2	0.500	0.700	0.020	0.028
b	0.360	0.500	0.014	0.020
b1	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.980	5.280	0.196	0.208
D1	3.780	4.080	0.149	0.161
E	3.450	3.750	0.136	0.148
e	1.270 TYP.		0.050 TYP.	
e1	3.710	3.910	0.146	0.154
L	14.900	15.300	0.587	0.602
θ	45° TYP.		45° TYP.	

Package SO6, 3-Pin SOT23-6L:



Symbol	Dimensions in MM		Dimensions in Inches	
	Min	Max	Min	Max
A	1.05	1.25	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
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950 TYP		0.037 TYP	
e 1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600 TYP		0.024 TYP	
θ	0°	8°	0°	8°

Ordering Information

Part No.	Pb-free	Temperature Code	Package Code	Packing
SS2707DESO6T	YES	-40°C to 85°C	SOT-23	7-in. reel, 3000 pieces/reel
SS2707DEU4A	YES	-40°C to 85°C	TO-92	Bulk, 1000 pieces/bag
SS2707DKSO6T	YES	-40°C to 125°C	SOT-23	7-in. reel, 3000 pieces/reel
SS2707KU4A	YES	-40°C to 125°C	TO-92	Bulk, 1000 pieces/bag
SS2707DLSO6T	YES	-40°C to 150°C	SOT-23	7-in. reel, 3000 pieces/reel
SS2707DLU4A	YES	-40°C to 150°C	TO-92	Bulk, 1000 pieces/bag