

InSb Hall Element

High Sensitivity Differential Analog Output Hall Element


AS106A

● General Description

This is a high sensitivity type of ANGSEMI hall element using evaporated InSb film. It performs effectively in low magnetic fields due to the high sensitivity. The input and output resistance values are suitable for transistor circuits.

The device is available in SOT23-4L packages is rated over the -40°C to 125°C. The all packages are RoHS and Green compliant.

● Features

- High sensitivity InSb Hall Element
- Shipped in Package tape Reel
- Differential Analog output
- Output Hall Voltage (mV)
 - I: 400mV to 470mV (DI)
 - J: 450mV to 520mV (DJ)
- RoHS & Green Compliant
- Thin 4pin SMT SOT23 Packages
- -40°C to +125 °C Temperature Range

● Applications

- Brushless DC Motor
- Other small precision motors
- DVD, CD-ROM, floppy disk drive
- Non-contacting, rotation sensors, current sensors
- Magnetic flux sensors other than those above

■ Typical Application Circuit

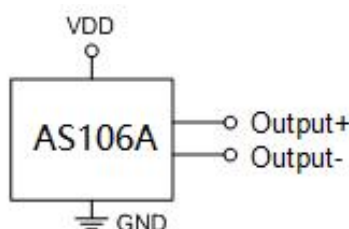
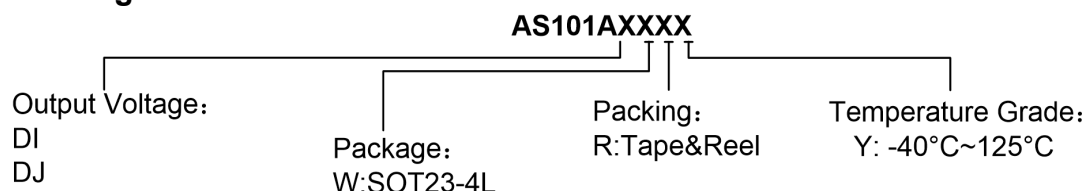


Figure 1, Typical Application Circuit of AS106A

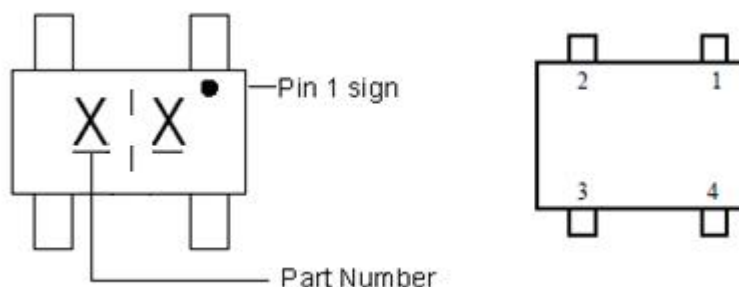
■ Ordering Information



Part Number	Output Hall Voltage (mV, B=50mT, VC=1V)	Package Type	Package Qty	Temperature	Eco Plan
AS106ADIWRY	400 to 470	SOT23-4L	7-in reel 3000pcs/reel	-40~125°C	Green
AS106ADJWRY	450 to 520	SOT23-4L	7-in reel 3000pcs/reel	-40~125°C	Green

■ Marking & Pin Assignment

SOT23-4L:



Pin Name	Pin No.		I/O	Pin Function
	SOT23-4L			
Input	1 (+)	3 (-)	I/P	Input Pins +/-
	1 (-)	3 (+)	I/P	Input Pins -/+
OUTPUT	2 (+)	4 (-)	I/P	Output Pins +/-
	2 (-)	4 (+)	I/P	Output Pins -/+

■ Absolute Maximum Ratings¹ (T_A=25°C, unless otherwise noted)

Parameter	Symbol	Rating	Unit
Max. Input Current	I _{MAX}	20	mA
Maximum Power Dissipation	P _{DMAX}	300	mW
Storage Temperature Range	T _S	-55 to +150	°C
Operating Junction Temperature Range	T _{OP}	-40 to +125	°C
Maximum Soldering Temperature (at leads, 10 sec)	T _{LEAD}	260	°C

Note: 1: Stresses above those listed in absolute maximum ratings may cause permanent damage to the device. Functional operation at conditions other than the operating conditions specified is not implied. Only one absolute maximum rating should be applied at any one time.

2: The device is not guaranteed to function outside of its operating conditions.

■ Electrical Characteristics

(T_A = -40 to +125°C unless otherwise noted. Typical values are at T_A = +25°C, 1mT=10Gauss)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _H	Output Hall Voltage	Const. Voltage Drive, B=50mT, V _C =1V	400	-	520	mV
R _{IN}	Input Resistance	B=0mT, I _C =0.1mA	340	-	650	Ω
R _{OUT}	Output Resistance	B=0mT, I _C =0.1mA	340	-	650	Ω
V _{OS}	Offset Voltage	B=0mT, V _C =1V	-7	-	+7	mV
aV _H	Temp. Coefficient of V _H	B=50mT, I _C =5mA	-	-1.8	-	%/°C
aR _{IN}	Temp. Coefficient of R _{IN}	B=0mT, I _C =0.1mA	-	-1.8	-	%/°C
-	Dielectric Strength	100V D.C	1.0	-	-	MΩ

Notes: 1, V_H=V_{HM}-V_{OS} (V_{HM}: meter indication)

2, aV_H=1/(V_{HT1}) X (V_{H(T3)} - V_{H(T2)})/(T3-T2) X100

3, aR_{IN}=1/(R_{INT1}) X (R_{IN(T3)} - R_{IN(T2)})/(T3-T2) X100

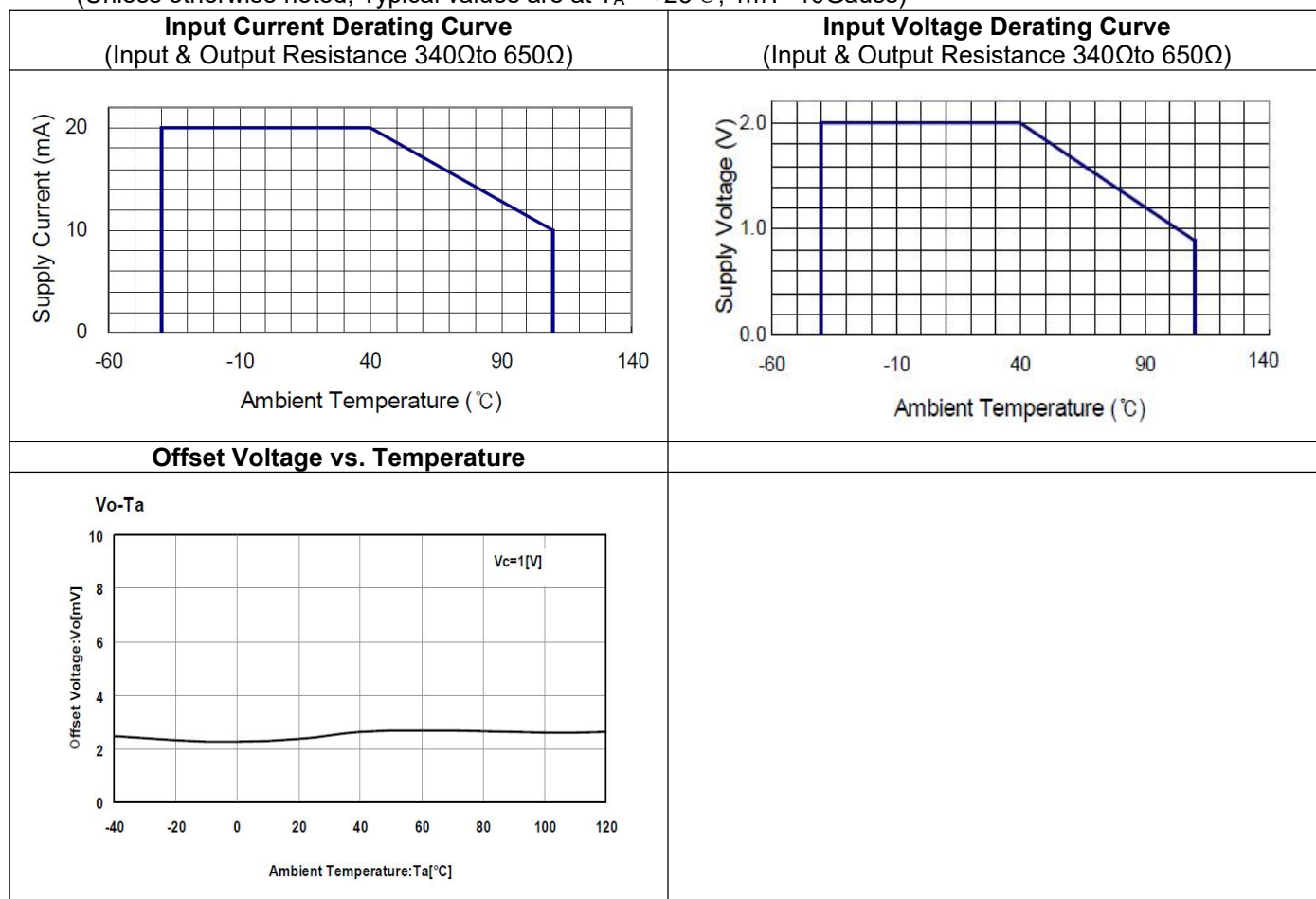
T1=20°C, T2=0°C, T3=40°C.

■ Classification of Output Hall Voltage (V_H)

Rank	V _H (mV)	Conditions
I	400 to 470	B=50mT, V _C =1V, Constant Voltage Drive
J	450 to 520	

■ Typical Characteristics—AS106A

(Unless otherwise noted, Typical values are at $T_A = +25^\circ\text{C}$, $1\text{mT}=10\text{Gauss}$)



Thermal Considerations

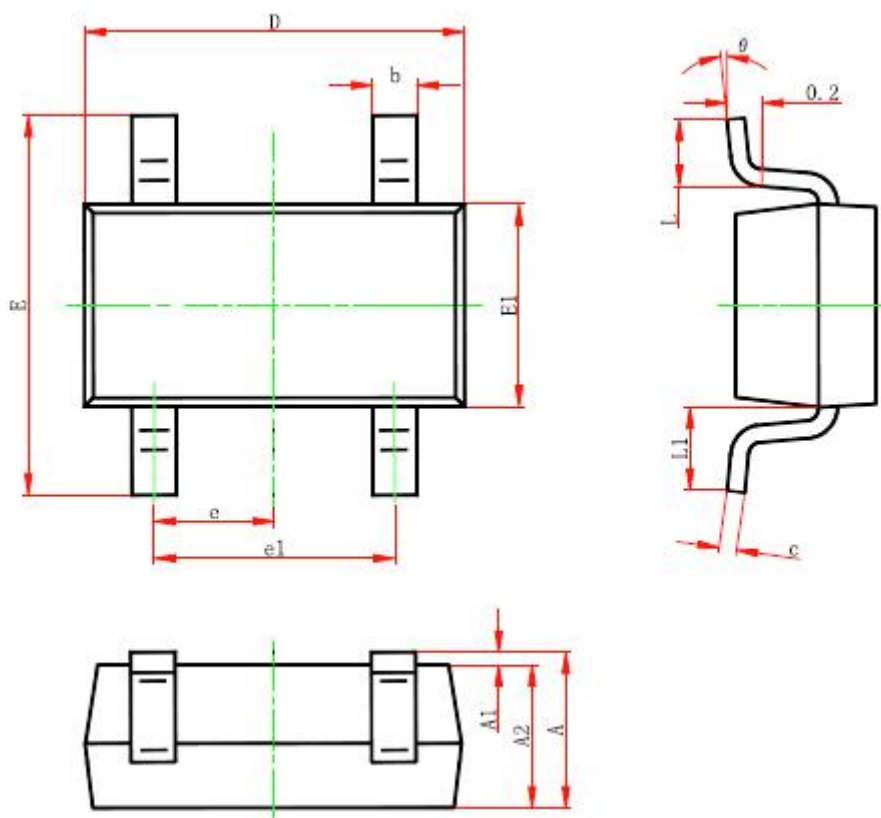
The maximum IC junction temperature should be restricted to 125°C under normal operating conditions. This restriction limits the power dissipation of the AS106A. Calculate the maximum allowable dissipation, $P_{D(\text{max})}$, and keep the actual dissipation less than or equal to $P_{D(\text{max})}$. The maximum-power-dissipation limit is determined using following equation:

$$P_{D(\text{MAX})} = \frac{125^\circ\text{C} - T_A}{R_{\theta JA}}$$

Where, T_A is the maximum ambient temperature for the application. $R_{\theta JA}$ is the thermal resistance junction-to-ambient given in Power Dissipation Table.

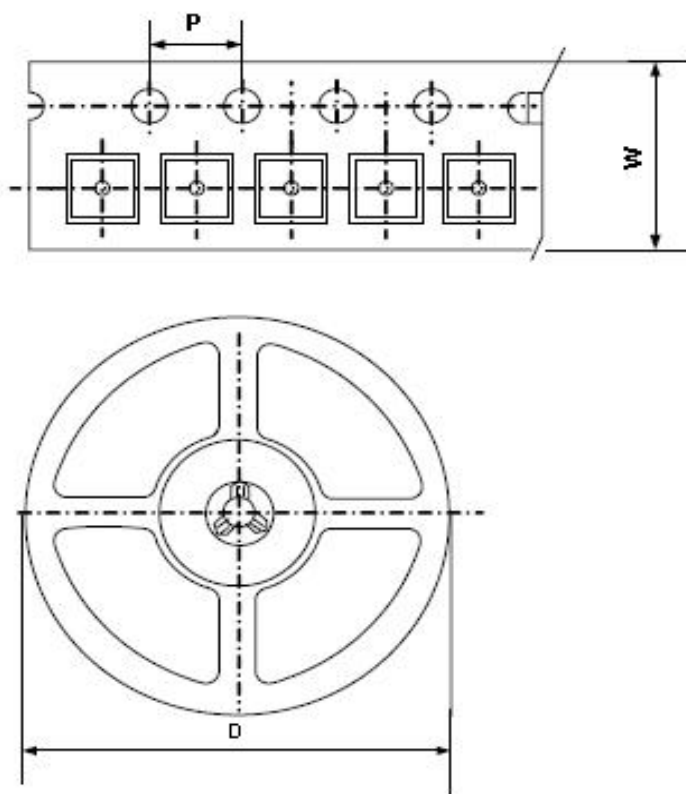
Package Information

SOT23-4L (W):



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
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950 (BSC)		0.037 (BSC)	
e1	1.90(BSC)		0.075(BSC)	
L	0.300	0.600	0.012	0.024
L1	0.600 REF.		0.024 REF.	
θ	0°	8°	0°	8°

■ Packing Information



Package Type	Carrier Width(W)	Pitch(P)	Reel Size(D)	Packing Minimum
SOT23-4L	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs

Note: Carrier Tape Dimension, Reel Size and Packing Minimum