

InSb Hall Element

**Differential Analog
Output Hall Element****AS103A****● 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 SOT343 package 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 Real
- Differential Analog output
- Output Hall Voltage (mV)
 - D: 196mV to 236mV (DD)
 - E: 228mV to 274mV (DE)
 - F: 266mV to 320mV (DF)
 - G: 310mV to 370mV (DG)
 - H: 360mV to 430mV (DH)
- RoHS & Green Compliant
- Thin 4pin SMT SOT343 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

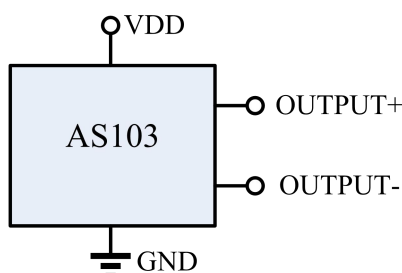
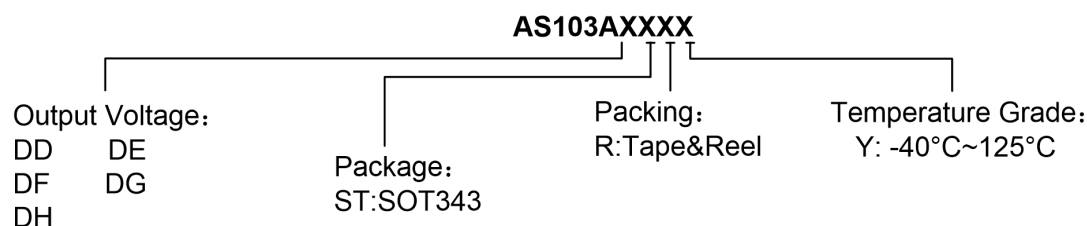
■ Typical Application Circuit

Figure 1, Typical Application Circuit of AS103A

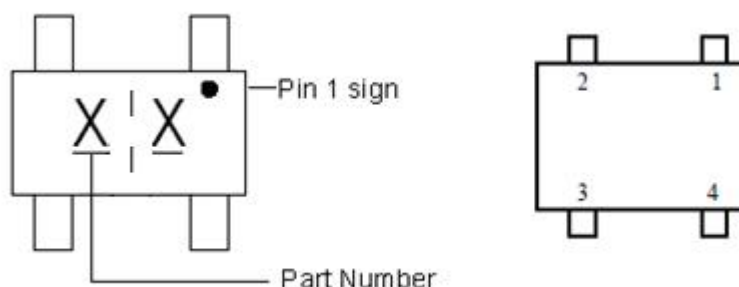
Ordering Information



Part Number	Output Hall Voltage (mV, B=50mT, VC=1V)	Package Type	Package Qty	Temperature	Eco Plan
AS103ADDSTRY	196 to 236	SOT343	7-in reel 3000pcs/reel	-40~125°C	Green
AS103ADESTRY	228 to 274	SOT343	7-in reel 3000pcs/reel	-40~125°C	Green
AS103ADFSTRY	266 to 320	SOT343	7-in reel 3000pcs/reel	-40~125°C	Green
AS103ADGSTRY	310 to 370	SOT343	7-in reel 3000pcs/reel	-40~125°C	Green
AS103ADHSTRY	360 to 430	SOT343	7-in reel 3000pcs/reel	-40~125°C	Green

Marking & Pin Assignment

SOT343:



Pin Name	Pin No.		I/O	Pin Function
	SOT343			
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 $+125^\circ\text{C}$ unless otherwise noted. Typical values are at $T_A = +25^\circ\text{C}$, $1\text{mT}=10\text{Gauss}$)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_H	Output Hall Voltage	Const. Voltage Drive, $B=50\text{mT}$, $V_C=1\text{V}$	196	-	430	mV
R_{IN}	Input Resistance	$B=0\text{mT}$, $I_C=0.1\text{mA}$	340	-	650	Ω
R_{OUT}	Output Resistance	$B=0\text{mT}$, $I_C=0.1\text{mA}$	340	-	650	Ω
V_{OS}	Offset Voltage	$B=0\text{mT}$, $V_C=1\text{V}$	-7	-	+7	mV
aV_H	Temp. Coefficient of V_H	$B=50\text{mT}$, $I_C=5\text{mA}$	-	-1.8	-	$\%/^\circ\text{C}$
aR_{IN}	Temp. Coefficient of R_{IN}	$B=0\text{mT}$, $I_C=0.1\text{mA}$	-	-1.8	-	$\%/^\circ\text{C}$
-	Dielectric Strength	100V D.C	1.0	-	-	M Ω

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

2, $aV_H = 1/(V_{HT1}) \times (V_{H(T3)} - V_{H(T2)}) / (T3 - T2) \times 100$

3, $aR_{IN} = 1/(R_{INT1}) \times (R_{IN(T3)} - R_{IN(T2)}) / (T3 - T2) \times 100$

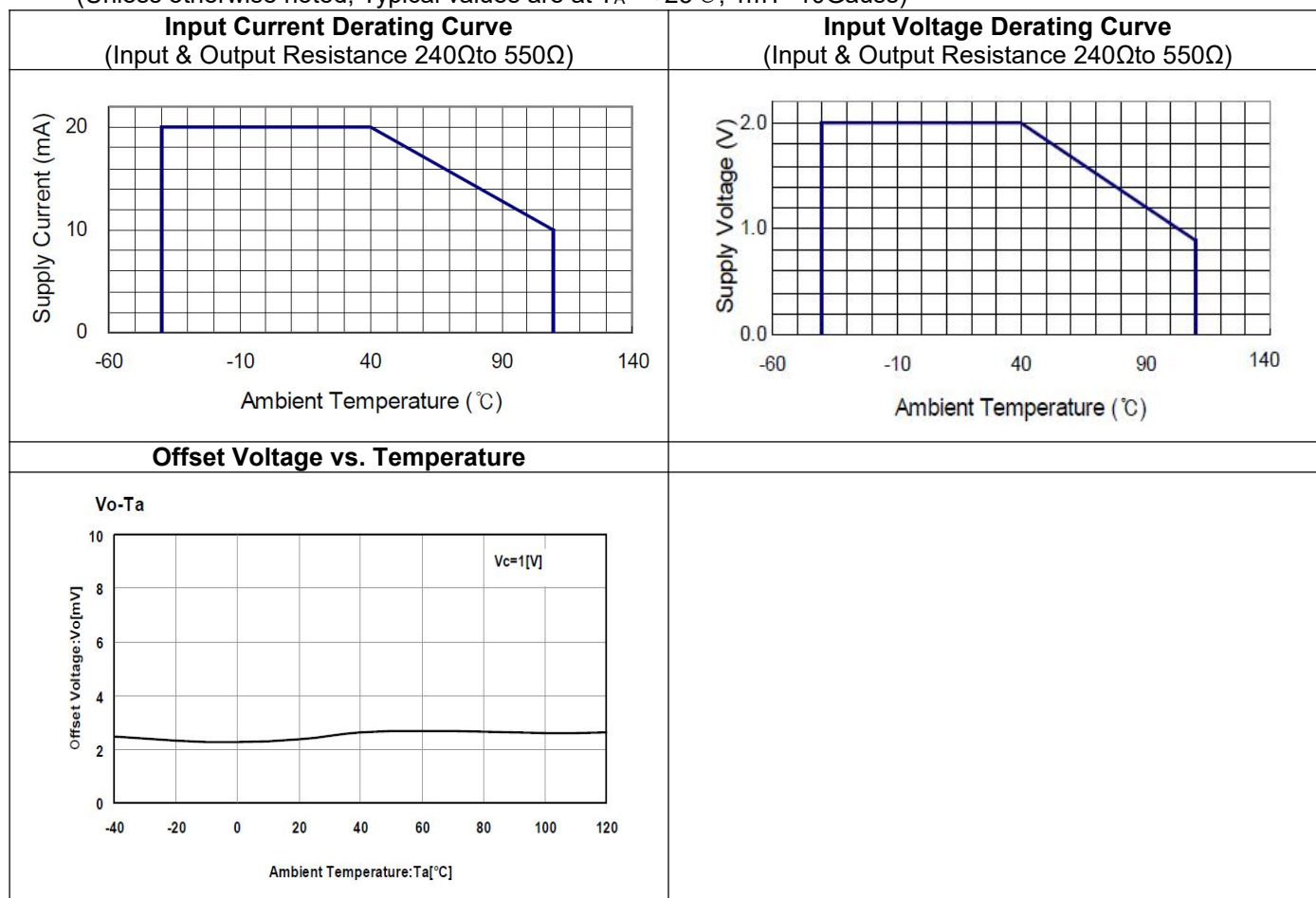
$T1=20^\circ\text{C}$, $T2=0^\circ\text{C}$, $T3=40^\circ\text{C}$.

■ Classification of Output Hall Voltage (V_H)

Rank	$V_H(\text{mV})$	Conditions
D	196 to 236	$B=50\text{mT}$, $V_C=1\text{V}$, Constant Voltage Drive
E	228 to 274	
F	266 to 320	
G	310 to 370	
H	360 to 430	

■ Typical Characteristics—AS103A

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



Thermal Considerations

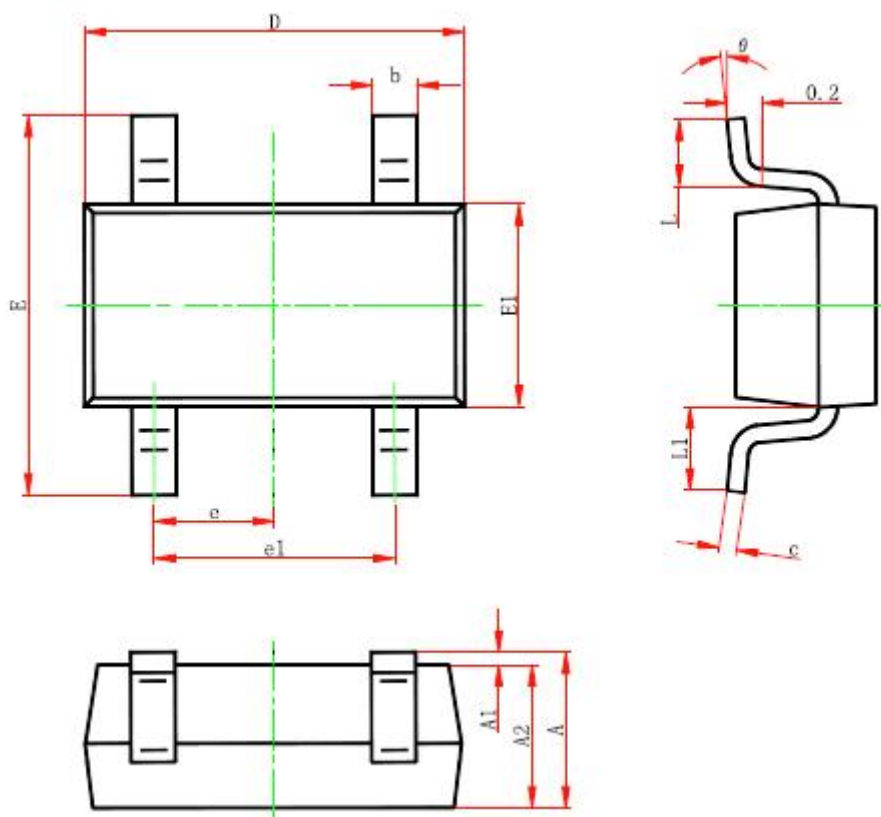
The maximum IC junction temperature should be restricted to 125°C under normal operating conditions. This restriction limits the power dissipation of the AS103A. Calculate the maximum allowable dissipation, $P_{D(max)}$, and keep the actual dissipation less than or equal to $P_{D(max)}$. The maximum-power-dissipation limit is determined using following equation:

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

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.

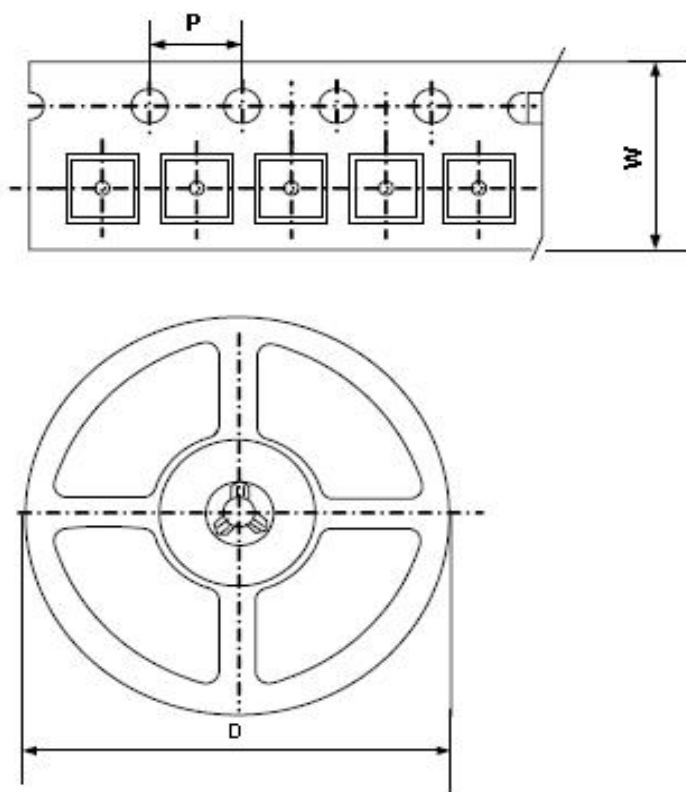
■ Package Information

SOT343:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.300 (BSC)		0.012 (BSC)	
c	0.100	0.200	0.004	0.008
D	2.000	2.200	0.079	0.087
E	2.000	2.200	0.079	0.087
E1	1.150	1.350	0.045	0.053
e	0.650 (BSC)		0.026 (BSC)	
e1	1.30(BSC)		0.051(BSC)	
L	0.230	0.250	0.009	0.010
θ	0°	5°	0°	5°

■ Packing Information



Package Type	Carrier Width(W)	Pitch(P)	Reel Size(D)	Packing Minimum
SOT343	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs

Note: Carrier Tape Dimension, Reel Size and Packing Minimum