

NANOS Hall Sensor Line-up

InSb Hall Sensor

InSb Hall Sensor			Package		Reel Q'ty	Dimension (mm)
Part No.	Model	Top	Side			
SH-12A	1	HE12AD1U12			3000pcs/reel	W:2.90 L:2.90 H:1.10
	2	HE12AE1U12				
	3	HE12AF1U12				
	4	HE12AG1U12				
SH-12B	1	HE12BD1U12			3000pcs/reel	W:3.90 L:2.90 H:1.10
	2	HE12BE1U12				
	3	HE12BF1U12				
	4	HE12BG1U12				
SH-22A	1	HE22AD1U12			1800pcs/reel	W:3.10 L:2.90 H:2.05
	2	HE22AE1U12				
	3	HE22AF1U12				
	4	HE22AG1U12				
SH-52A	1	HE52AC1U12			5000pcs/reel	W:2.10 L:2.10 H:0.55
	2	HE52AD1U12				
SH-82A	1	HE82AD1U12			4000pcs/reel	W:2.10 L:2.10 H:0.80
	2	HE82AE1U12				
	3	HE82AF1U12				
SH-34C	1	HE34CC1B12			500pcs/bulk	W:2.70 L:2.90 H:1.65 Lead:8.0
	2	HE34CD1B12				
	3	HE34CE1B12				
	4	HE34CF1B12				

GaAs Hall Sensor

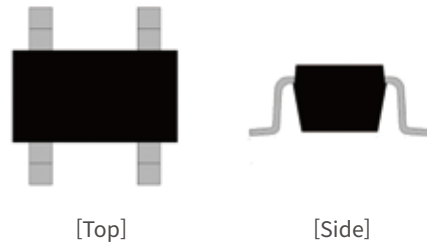
GaAs Hall Sensor			Package		Reel Q'ty	Dimension (mm)
Part No.	Model	Top	Side			
SH-61D	1	HE61DY2U22			10000pcs/reel	W:1.20 L:0.50 H:0.30
SH-62D	1	HE62DX3U22				

InSb Hall Sensor SH-12A

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Maximum Input Current	I _{max}	20 (at 25°C)	mA
Maximum Power Dissipation	P _{max}	150 (at 25°C)	mW
Operating Temp. Range	T _{op}	-40 ~ +120	°C
Storage Temp. Range	T _{st}	-40 ~ +150	°C

Package



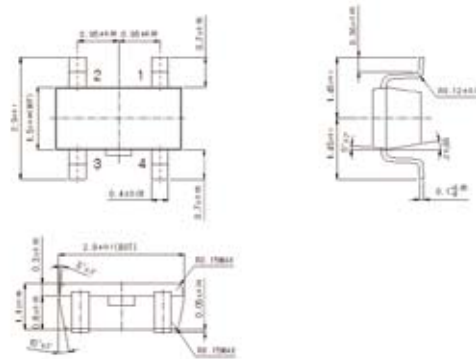
Electrical Specifications

Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	V _h	V _{in} =1V B=50mT	196	370	mV
Input Resistance	R _{in}	I=0.1mA	240	550	Ω
Output Resistance	R _{out}	I=0.1mA	240	550	Ω
Offset Voltage	V _o	V _{in} =1V B=0mT	-7	+7	mV
Temp. Coeff. of V _H	α	Avg. 0~40°C B=50mT I=5mA	Typ. -1.8		% /°C
Temp. Coeff. of R _{in} , R _{out}	β	Avg. 0~40°C B=0mT I=0.1mA	Typ. -1.8		% /°C

Marking (by laser)



Package Drawing



Notes : 1. V_h = V_{hm} - V_o (V_{hm} : voltage meter indication)
 2. α = [1/V_h(T₁)] X [V_h(T₃) - V_h(T₂)] / [T₃ - T₂] X 100
 3. β = [1/R_{in}(T₁)] X [R_{in}(T₃) - R_{in}(T₂)] / [T₃ - T₂] X 100
 4. T₁ = 20°C, T₂ = 0°C, T₃ = 40°C

Hall Sensor's Rank (by Output Hall Voltage)

Output Hall Voltage	Rank	Mark	Conditions
196 ~ 236	D	·SD	V _{in} =1V, B=500G (Constant Voltage)
228 ~ 274	E	·SE	
266 ~ 320	F	·SF	
310 ~ 370	G	·SG	

Pin Map

	Pin Map	
Input	1 [±]	3 [±]
Output	2 [±]	4 [±]

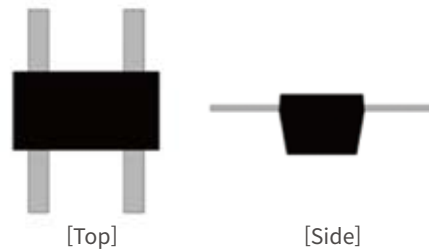
Packing Quantity : 3,000pcs/reel

InSb Hall Sensor SH-12B

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Maximum Input Current	I _{max}	20 (at 25°C)	mA
Maximum Power Dissipation	P _{max}	150 (at 25°C)	mW
Operating Temp. Range	T _{op}	-40 ~ +120	°C
Storage Temp. Range	T _{st}	-40 ~ +150	°C

Package



Electrical Specifications

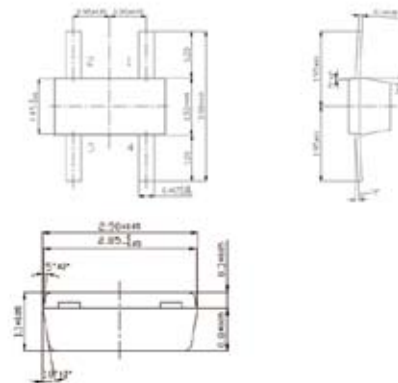
Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	V _h	V _{in} =1V B=50mT	196	370	mV
Input Resistance	R _{in}	I=0.1mA	240	550	Ω
Output Resistance	R _{out}	I=0.1mA	240	550	Ω
Offset Voltage	V _o	V _{in} =1V B=0mT	-7	+7	mV
Temp. Coeff. of V _H	α	Avg. 0~40°C B=50mT I=5mA	Typ. -1.8		% / °C
Temp. Coeff. of R _{in} , R _{out}	β	Avg. 0~40°C B=0mT I=0.1mA	Typ. -1.8		% / °C

Notes : 1. V_h = V_{hm} - V_o (V_{hm} : voltage meter indication)
 2. α = [1/V_h(T₁)] × [V_h(T₃) - V_h(T₂)] / [T₃ - T₂] × 100
 3. β = [1/R_{in}(T₁)] × [R_{in}(T₃) - R_{in}(T₂)] / [T₃ - T₂] × 100
 4. T₁ = 20°C, T₂ = 0°C, T₃ = 40°C

Marking (by laser)



Package Drawing



Hall Sensor's Rank (by Output Hall Voltage)

Output Hall Voltage	Rank	Mark	Conditions
196 ~ 236	D	·SD	V _{in} =1V, B=500G (Constant Voltage)
228 ~ 274	E	·SE	
266 ~ 320	F	·SF	
310 ~ 370	G	·SG	

Pin Map

	Pin Map	
Input	1 [±]	3 [±]
Output	2 [±]	4 [±]

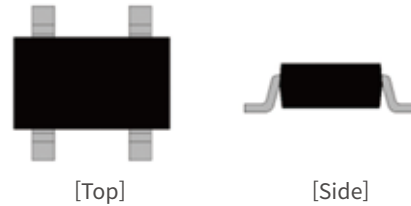
Packing Quantity : 3,000pcs/reel

InSb Hall Sensor SH-52A

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Maximum Input Current	I _{max}	20 (at 25°C)	mA
Maximum Power Dissipation	P _{max}	150 (at 25°C)	mW
Operating Temp. Range	T _{op}	-40 ~ +120	°C
Storage Temp. Range	T _{st}	-40 ~ +150	°C

Package



Electrical Specifications

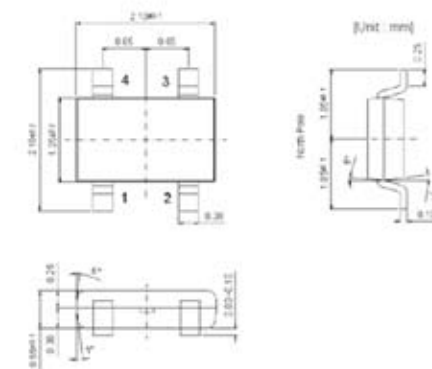
Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	V _h	V _{in} =1V B=50mT	168	236	mV
Input Resistance	R _{in}	I=0.1mA	240	550	Ω
Output Resistance	R _{out}	I=0.1mA	240	550	Ω
Offset Voltage	V _o	V _{in} =1V B=0mT	-7	+7	mV
Temp. Coeff. of V _H	α	Avg. 0~40°C B=50mT I=5mA	Typ. -1.8		% /°C
Temp. Coeff. of R _{in} , R _{out}	β	Avg. 0~40°C B=0mT I=0.1mA	Typ. -1.8		% /°C

Notes : 1. V_h = V_{hm} - V_o (V_{hm} : voltage meter indication)
 2. $\alpha = [1/V_h(T1)] \times [V_h(T3) - V_h(T2)] / [T3 - T2] \times 100$
 3. $\beta = [1/R_{in}(T1)] \times [R_{in}(T3) - R_{in}(T2)] / [T3 - T2] \times 100$
 4. T₁ = 20°C, T₂ = 0°C, T₃ = 40°C

Marking (by laser)



Package Drawing



Hall Sensor's Rank (by Output Hall Voltage)

Output Hall Voltage	Rank	Mark	Conditions
168 ~ 204	C	·C	V _{in} =1V, B=500G (Constant Voltage)
196 ~ 236	D	·D	

Pin Map

Pin Map		
Input	1 [±]	3 [±]
Output	2 [±]	4 [±]

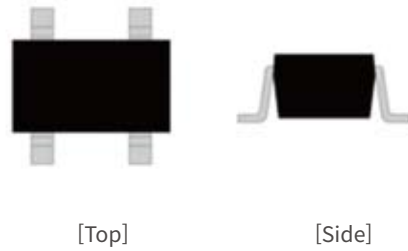
Packing Quantity : 5,000pcs/reel

InSb Hall Sensor SH-82A

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Maximum Input Current	I _{max}	20 (at 25°C)	mA
Maximum Power Dissipation	P _{max}	150 (at 25°C)	mW
Operating Temp. Range	T _{op}	-40 ~ +120	°C
Storage Temp. Range	T _{st}	-40 ~ +150	°C

Package



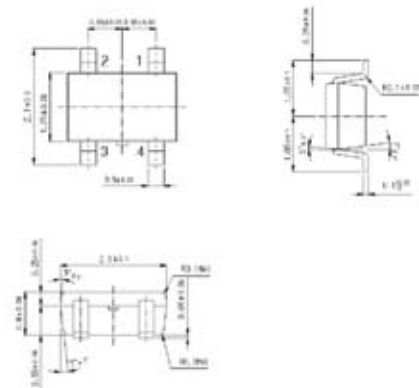
Electrical Specifications

Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	V _h	V _{in} =1V B=50mT	196	320	mV
Input Resistance	R _{in}	I=0.1mA	240	550	Ω
Output Resistance	R _{out}	I=0.1mA	240	550	Ω
Offset Voltage	V _o	V _{in} =1V B=0mT	-7	+7	mV
Temp. Coeff. of V _H	α	Avg. 0~40°C B=50mT I=5mA	Typ. -1.8		% /°C
Temp. Coeff. of R _{in} , R _{out}	β	Avg. 0~40°C B=0mT I=0.1mA	Typ. -1.8		% /°C

Marking (by laser)



Package Drawing



Hall Sensor's Rank (by Output Hall Voltage)

Output Hall Voltage	Rank	Mark	Conditions
196 ~ 236	D	·D	V _{in} =1V, B=500G (Constant Voltage)
228 ~ 274	E	·E	
266 ~ 320	F	·F	

Pin Map

	Pin Map	
Input	1 [±]	3 [±]
Output	2 [±]	4 [±]

Packing Quantity : 4,000pcs/reel

InSb Hall Sensor SH-34C

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Maximum Input Current	I _{max}	20 (at 25°C)	mA
Maximum Power Dissipation	P _{max}	150 (at 25°C)	mW
Operating Temp. Range	T _{op}	-40 ~ +120	°C
Storage Temp. Range	T _{st}	-40 ~ +150	°C

Package



Electrical Specifications

Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	V _h	V _{in} =1V B=50mT	196	320	mV
Input Resistance	R _{in}	I=0.1mA	240	550	Ω
Output Resistance	R _{out}	I=0.1mA	240	550	Ω
Offset Voltage	V _o	V _{in} =1V B=0mT	-7	+7	mV
Temp. Coeff. of V _H	α	Avg. 0~40°C B=50mT I=5mA	Typ. -1.8		% / °C
Temp. Coeff. of R _{in} , R _{out}	β	Avg. 0~40°C B=0mT I=0.1mA	Typ. -1.8		% / °C

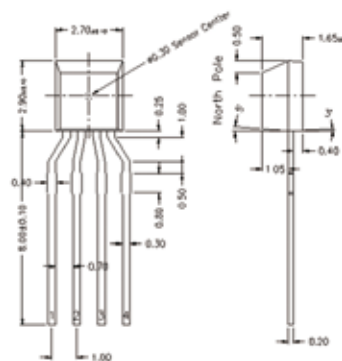
Notes : 1. V_h = V_{hm} - V_o (V_{hm} : voltage meter indication)
 2. α = 1/V_h(T1) × [V_h(T3) - V_h(T2)] / [T3 - T2] × 100
 3. β = 1/R_{in}(T1) × [R_{in}(T3) - R_{in}(T2)] / [T3 - T2] × 100
 4. T1 = 20°C, T2 = 0°C, T3 = 40°C

Marking (by laser)



C : Rank C
 D : Rank D
 E : Rank E
 F : Rank F

Package Drawing



Hall Sensor's Rank (by Output Hall Voltage)

Output Hall Voltage	Rank	Mark	Conditions
196 ~ 236	C	·C	V _{in} =1V, B=500G (Constant Voltage)
196 ~ 236	D	·D	
228 ~ 274	E	·E	
266 ~ 320	F	·F	

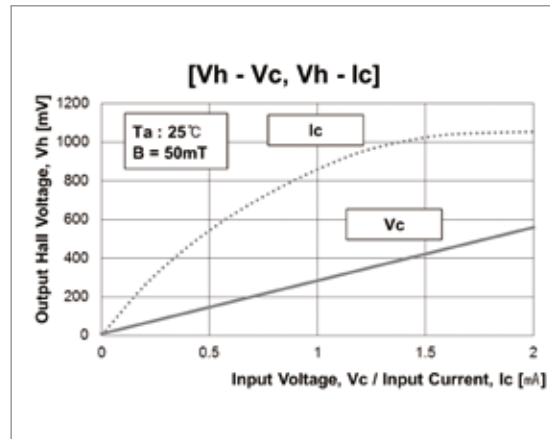
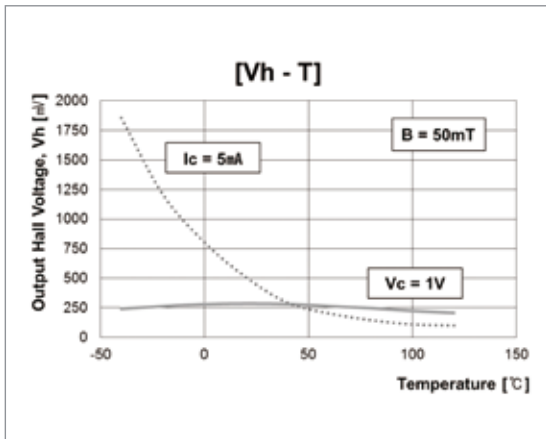
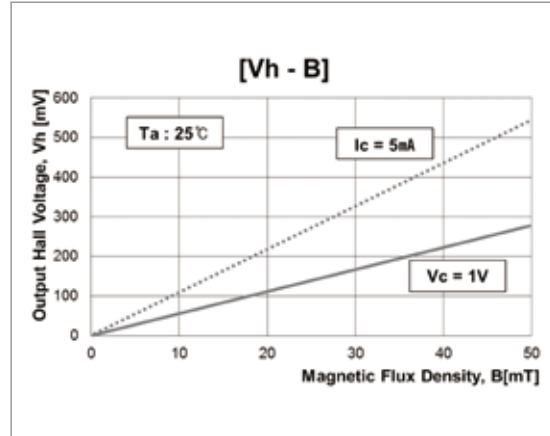
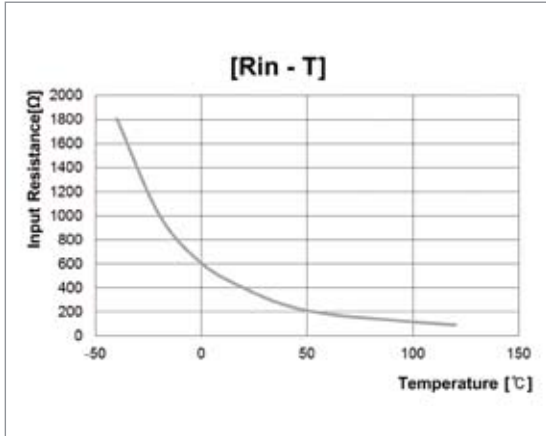
Pin Map

	Pin Map	
Input	1 [±]	3 [±]
Output	2 [±]	4 [±]

Packing Quantity : 500pcs (Bulk)

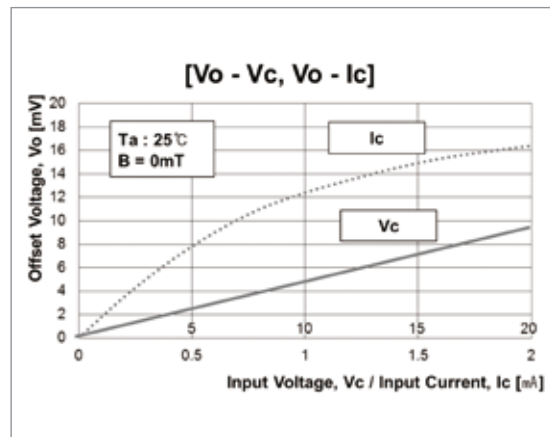
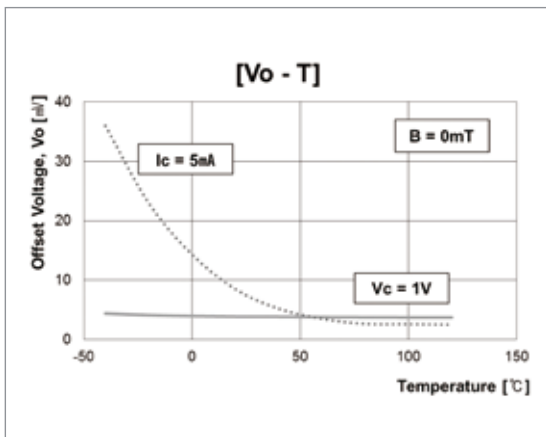
InSb Hall Sensor Characteristic Curves

InSb Hall Sensor Characteristic Curves



[For reference only]

[For reference only]



GaAs Hall Sensor SH-61D

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Maximum Power Input Voltage	Vc	8	V
Maximum Power Dissipation	Pmax	150	mW
Operating Temp. Range	Top	-40 ~ +125	°C
Storage Temp. Range	Tst	-40 ~ +150	°C

Package



[Top]



[Bottom]

Electrical Specifications

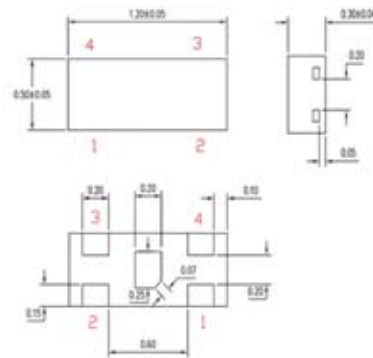
Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	Vh	Vin=6V, B=50mT	78	102	mV
Input Resistance	Rin	Ic=0.1mA	1,600	2,400	Ω
Output Resistance	Rout	Ic=0.1mA	3,200	4,800	Ω
Offset Voltage	Vo	Vin=6V B=0mT	-8	8	mV
Temp. Coeff. of VH	α	Avg.25~125°C B=50mT Ic=5mA	-	-0.07	%/°C
Temp. Coeff. of Rin	β	Avg.25~125°C B=0mT Ic=0.1mA	-	0.3	%/°C
Linearity	ΔK	B=0.1T/0.5T Ic=5mA	-	2	%

Marking (by laser)



S : Year & Month
J : Date

Package Drawing



Pin Map

Pin Map		
Input	1 [±]	3 [±]
Output	2 [±]	4 [±]

※No.3 and center pad are electrically connected.

Packing Quantity : 10,000pcs/reel

Notes :

1. Vh = Vhm - Vo (Vhm : voltage meter indication)

$$2. \alpha = \frac{1}{Vh[T1]} \times \frac{Vh[T2] - Vh[T1]}{T2 - T1} \times 100$$

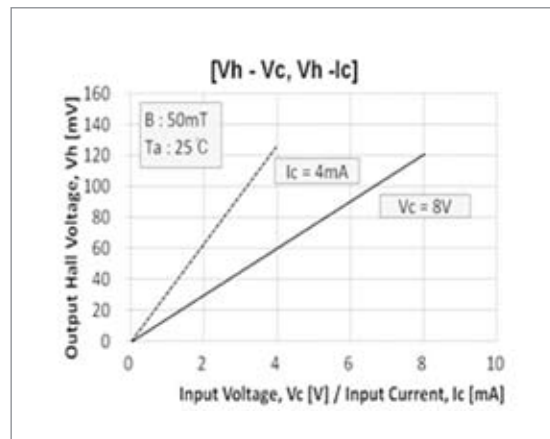
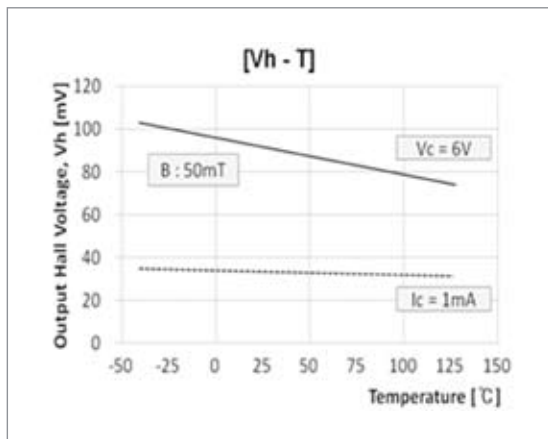
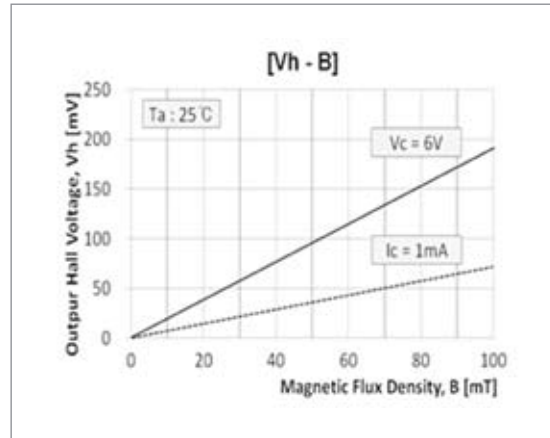
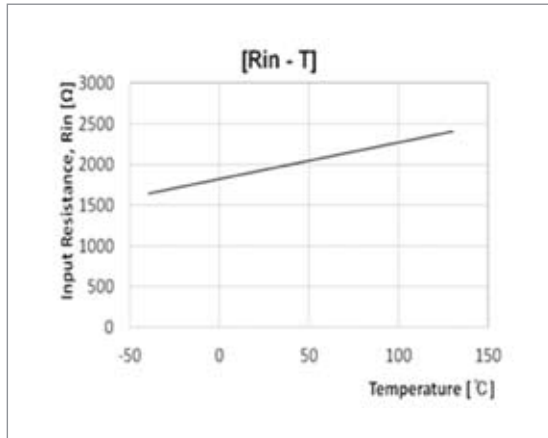
$$3. \beta = \frac{1}{Rin[T1]} \times \frac{Rin[T2] - Rin[T1]}{T2 - T1} \times 100$$

$$4. \Delta K = \frac{K[B1] - K[B2]}{[K(B1) + K(B2)]/2}$$

5. T1 = 25°C, T2 = 125°C
K = Vh / (Ic * B)
B1 = 0.5T, B2 = 0.1T

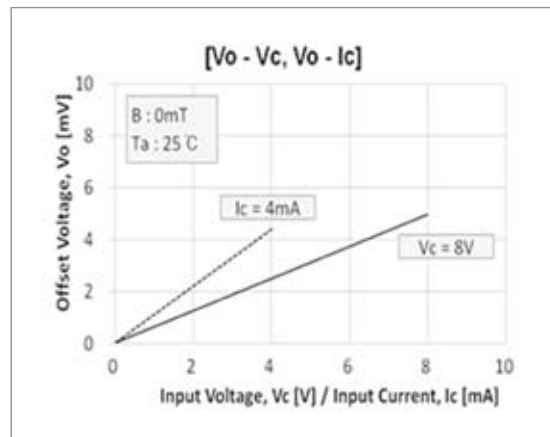
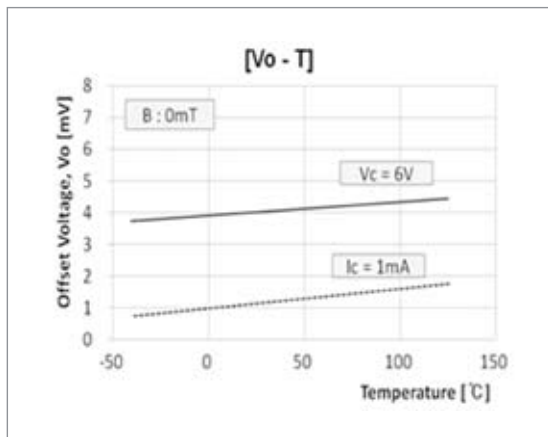
GaAs Hall Sensor Characteristic Curves

GaAs Hall Sensor(SH-61D) Characteristic Curves



[For reference only]

[For reference only]



GaAs Hall Sensor SH-62D

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Maximum Power Input Voltage	Vc	20 (at 25°C)	V
Maximum Power Dissipation	Pmax	150 (at 25°C)	mW
Operating Temp. Range	Top	-40 ~ +120	°C
Storage Temp. Range	Tst	-40 ~ +150	°C

Package



[Top]



[Bottom]

Electrical Specifications

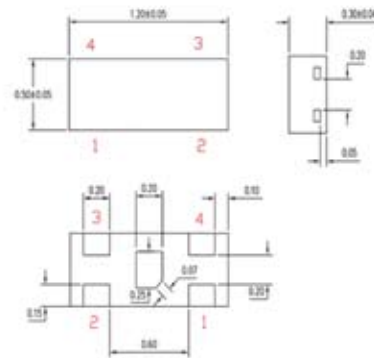
Parameter	Symbol	Conditions	Min	Max	Unit
Output Hall Voltage	Vh	Vin=6V, B=50mT	60	80	mV
Input Resistance	Rin	Ic=0.1mA	650	850	Ω
Output Resistance	Rout	Ic=0.1mA	650	850	Ω
Offset Voltage	Vo	Vin=6V B=0mT	-11	11	mV
Temp. Coeff. of VH	α	Avg.25~125°C B=50mT Ic=5mA	-	-0.07	%/°C
Temp. Coeff. of Rin	β	Avg.25~125°C B=0mT Ic=0.1mA	-	0.3	%/°C
Linearity	ΔK	B=0.1T/0.5T Ic=5mA	-	2	%

Marking (by laser)



- : SH-62D
S : Year & Month
J : Date

Package Drawing



Pin Map

Pin Map		
Input	1 [±]	3 [±]
Output	2 [±]	4 [±]

※No.3 and center pad are electrically connected.

Packing Quantity : 10,000pcs/reel

Notes :

1. Vh = Vhm - Vo (Vhm : voltage meter indication)

$$2. \alpha = \frac{1}{Vh[T1]} \times \frac{Vh[T2] - Vh[T1]}{T2 - T1} \times 100$$

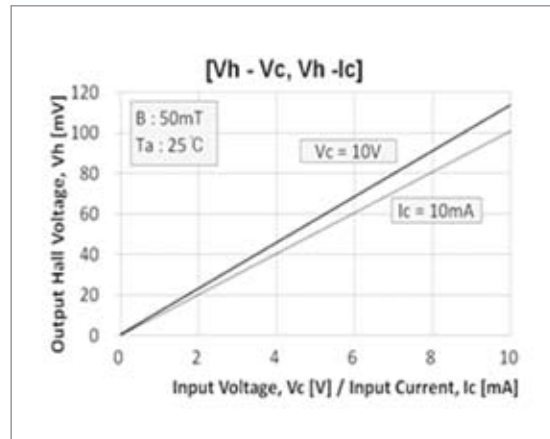
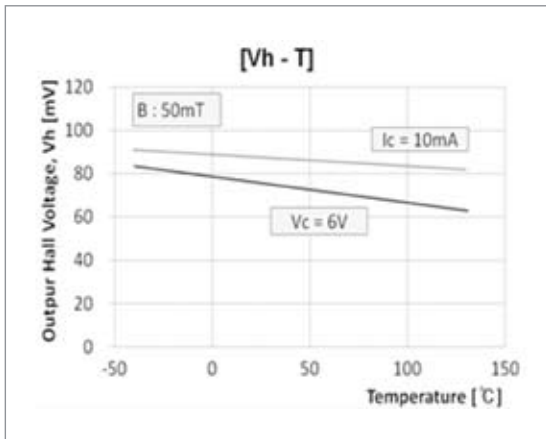
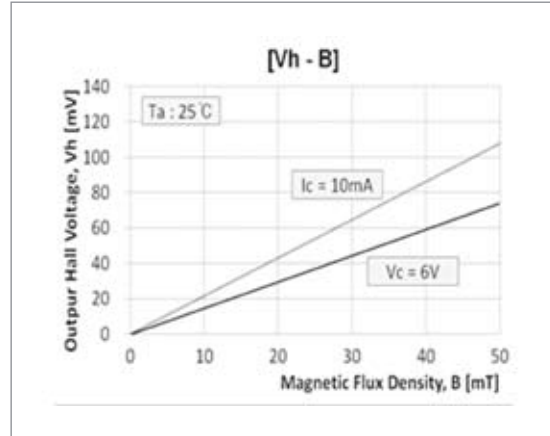
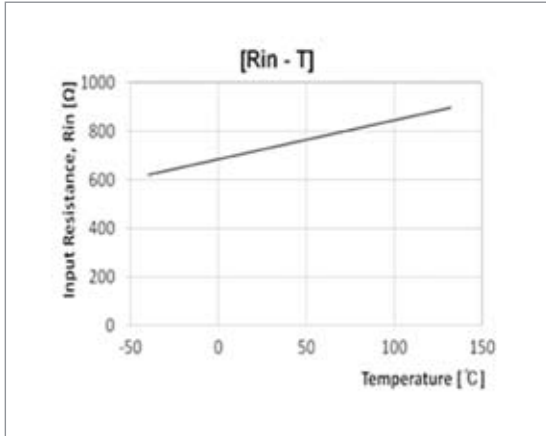
$$3. \beta = \frac{1}{Rin[T1]} \times \frac{Rin[T2] - Rin[T1]}{T2 - T1} \times 100$$

$$4. \Delta K = \frac{K[B1] - K[B2]}{[K(B1) + K(B2)]/2}$$

5. T1 = 25°C, T2 = 125°C
K = Vh / (Ic * B)
B1 = 0.5T, B2 = 0.1T

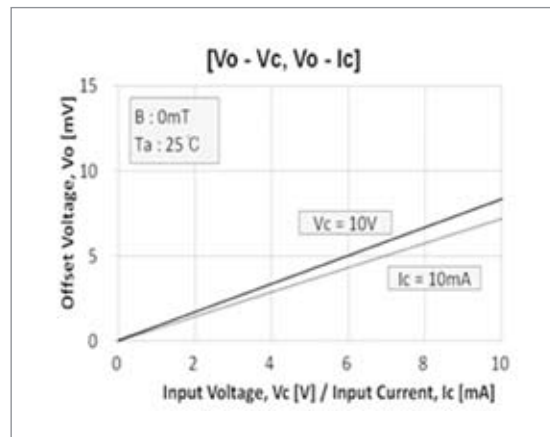
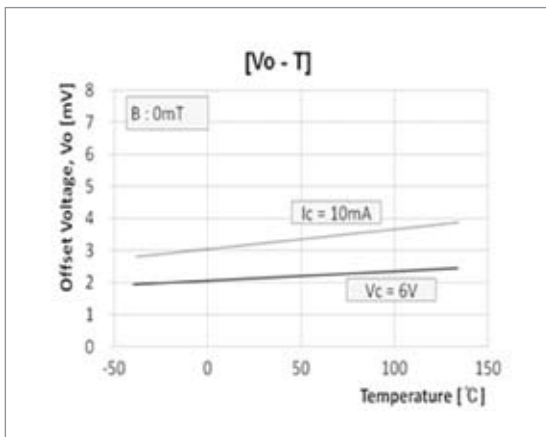
GaAs Hall Sensor Characteristic Curves

GaAs Hall Sensor(SH-62D) Characteristic Curves



[For reference only]

[For reference only]



Hall Sensor Reliability Test

InSb Hall Sensor Reliability Test

1. Test Items

No	Test Item	Test Condition	Quantity	Time
1	High Temp. Storage	Ta=150°C	22pcs	1,000HR
2	High Temp. Operation	Ta=120°C, Iopr=10mA	22pcs	1,000HR
3	Low Temp. Operation	Ta=-40°C, Iopr=6mA	22pcs	1,000HR
4	High Temp. High Humidity Operation	Ta=85°C, HR=85%, Iopr=9mA	22pcs	1,000HR
5	PCT	Ta=121°C, HR=100%, Pv=2atm	22pcs	24HR
6	Thermal Shock	T(L)=-55°C, T(H)=150°C, t=(L,H)=30min		30Cycle
7	High Humidity Temp. Cycle	T(L)=-20°C, T(H)=85°C, t(L,H)=30min, HR=95%	22pcs	40Cycle
8	Soldering Heat Resistance	Peak Temp=260°C, t=10sec, Reflow	22pcs	-
9	ESD(MM)	V=500V, C=200pF, R=0Ω (EIAJ)	22pcs	-

2. Criterion for Judging

Item	OK Spec.	NG/OK
Rin	Under Initial ±20%	OK (Spec. Satisfying)
Rout		
VH		
Vo		

GaAs Hall Sensor Reliability Test

1. Test Items

No	Test Item	Test Condition	Quantity	Time
1	High Temp. High Humidity	Ta=85±5°C, Relative Humidity=85±5%RH	22pcs	1,000HR
2	High Temp. Operating	Ta=125±5°C, Vc=6.0V±10%	22pcs	1,000HR
3	Preconditioning	Preconditioning : Ta=150±5°C, 24HR Moisture Absorption : Ta=85±5°C, 85±5%RH, 168HR Reflow : Ta=260±5°C, 10sec	22pcs	2Cycle
4	High Temp. Storage	Ta=150±5°C	22pcs	1,000HR
5	Temp. Cycle	-55±5°C, 30min ↔ 25°C, 5min ↔ 150±5°C, 30min	22pcs	50Cycle

2. Criterion for Judging

Item	OK Spec.	NG/OK
Rin	Under Initial ±20%	OK (Spec. Satisfying)
Rout		
VH		
Vo		