

## CYTY302B (InSb) HALL-EFFECT ELEMENT

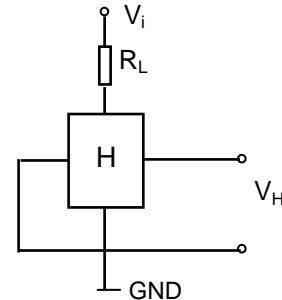
Hall-effect element CYTY302B is made of compound semiconductor material indium stibnite (InSb), which utilizes the Hall-effect principle. It can convert a magnetic flux density signal linearly into voltage output.

### FEATURES

- High Magnetic Sensitivity
- Low Offset Voltage
- Miniature Package

### TYPICAL APPLICATION

- Magnetic Field Measurement
- Current Sensor
- Detection of Speed
- DC Brushless Motor
- Position Control



### 1. Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Maximum Input Current	I <sub>max</sub>	20 (at 25°C)	mA
Maximum Power Dissipation	P <sub>max</sub>	150 (at 25°C)	mW
Operating Temperature Range	T <sub>op</sub>	- 40 ~ + 110	°C
Storage Temperature Range	T <sub>st</sub>	- 40 ~ + 125	°C

### 2. Electrical Characteristics (Measured at 25°C)

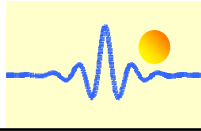
Parameter	Symbol	Measurement Conditions	Min	Max	Unit
Output Hall Voltage	V <sub>H</sub>	V <sub>in</sub> = 1V, B = 50mT	168	415	mV
Input Resistance	R <sub>in</sub>	I = 0.1mA	240	550	Ω
Output Resistance	R <sub>out</sub>	I = 0.1mA	240	550	Ω
Offset Voltage	V <sub>O</sub>	V <sub>in</sub> = 1V, B = 0G	- 7	+ 7	mV
Temp. Coeff. of V <sub>H</sub>	α	T <sub>a</sub> = 0 ~ + 40°C AVG.	-	- 1.8	% /°C
Temp. Coeff. of R <sub>in</sub> , R <sub>out</sub>	β	T <sub>a</sub> = 0 ~ + 40°C AVG.	-	- 1.8	% /°C
Dielectric strength		100V DC	1.0		MΩ

V<sub>H</sub> = V<sub>HM</sub> - V<sub>O</sub> (V<sub>HM</sub> : The output voltage measured at 500G.)

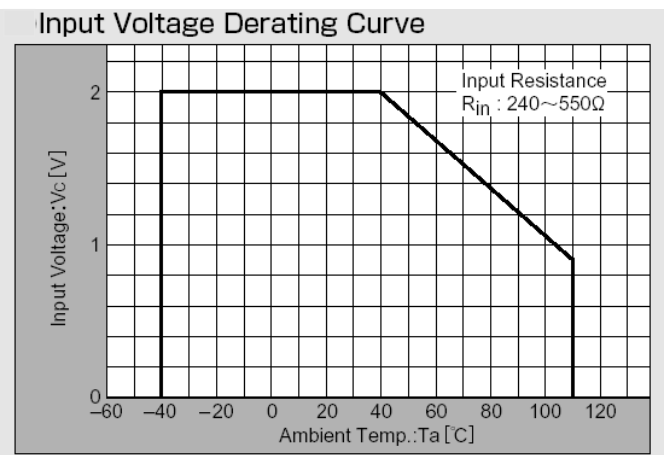
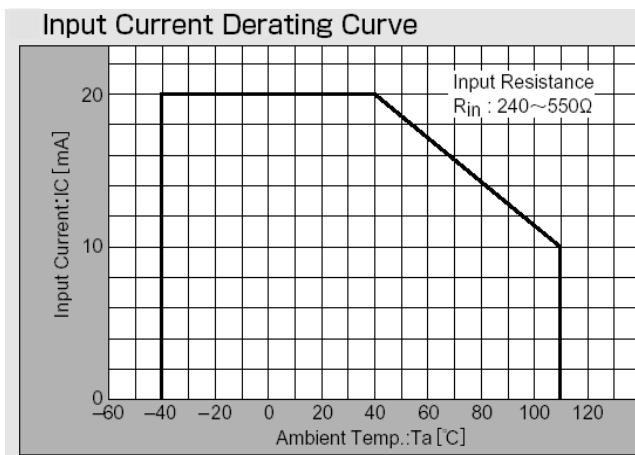
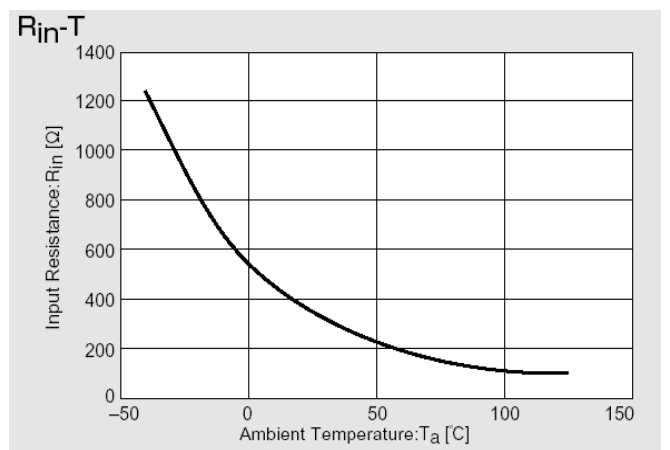
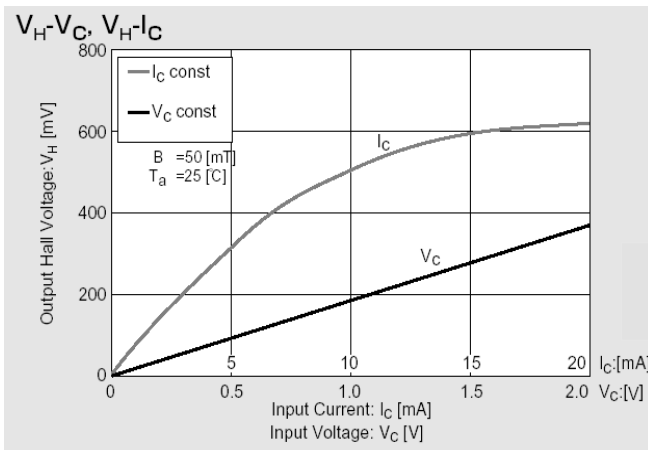
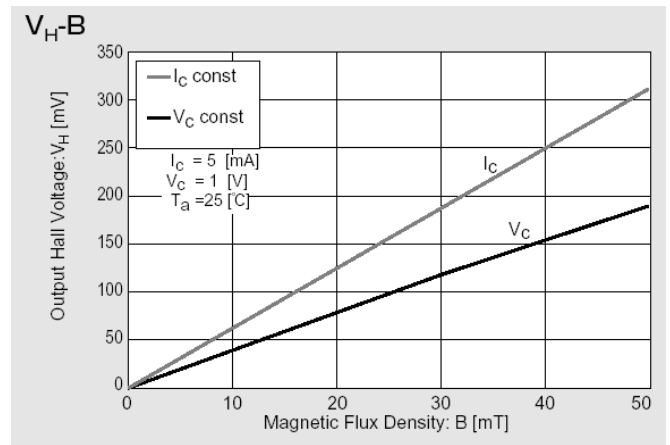
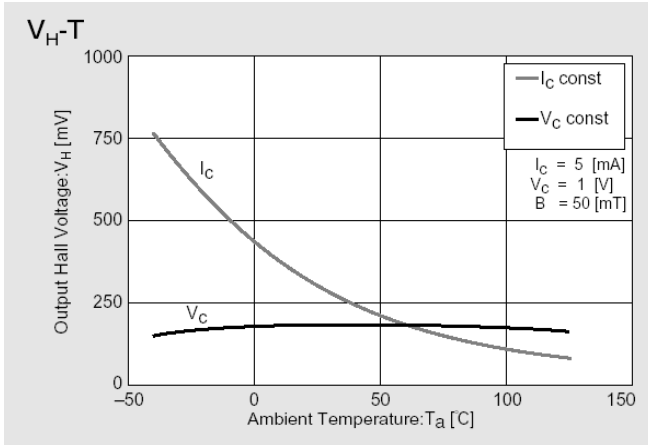
### 3. Rank Classification and Mark on Output Hall Voltage

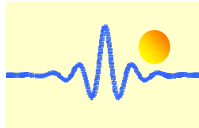
Output Hall Voltage, V <sub>H</sub> (mV)	Rank	Measurement Conditions
168 ~ 204	C	V <sub>in</sub> = 1V, B = 50mT (Constant Voltage)
196 ~ 236	D	
228 ~ 274	E	
266 ~ 320	F	
310 ~ 370	G*	
360 ~ 415	H*	

\*Sensors with rank G and H are custom made sensors

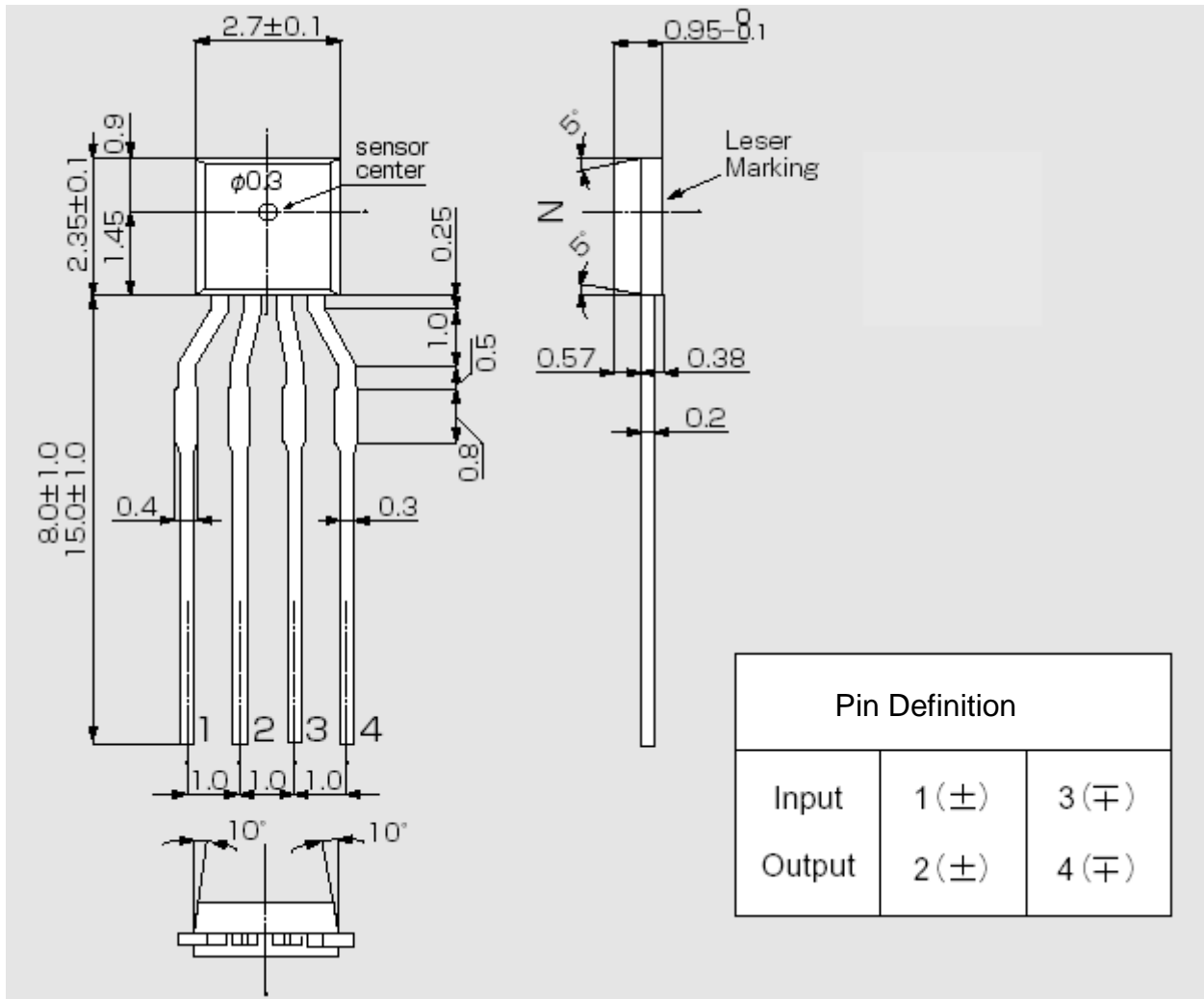


#### 4. CHARACTERISTIC CURVES (only for references)





#### 4. External Dimensions (Unit: mm)



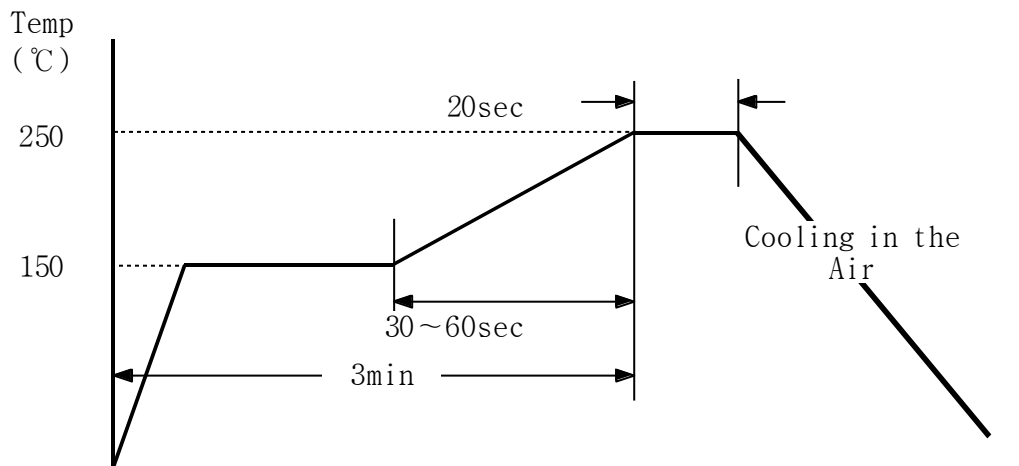
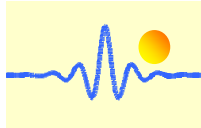
#### 5. Method for Mounting

##### 5-1. Soldering Conditions on PCB

1. No Rapid Heating and Cooling.
2. Recommended Preheating condition is at  $130 \sim 150^\circ\text{C}$  for 2~3minutes.
3. Recommended Reflowing condition is at  $220 \sim 230^\circ\text{C}$  for 10~15seconds.

##### 5-2. Soldering Method and Temperature

Items	Methods	Temperature
Reflow	Soldering by Passing the Heated Zone	Max $250^\circ\text{C}$ in 20sec
Solder Iron	Soldering by Soldering Iron	Max $300^\circ\text{C}$ in 3sec



## 6. RELIABILITY

### 6.1 TEST CONDITION

	CONDITION
HIGH TEMP. STORAGE	Ta=110°C,t=1000HR
LOW TEMP. STORAGE	Ta=-40°C,t=1000HR
HIGH TEMP. OPERATION	Ta=100°C,Iopr=6mA,t=1000HR
LOW TEMP. OPERATION	Ta=-20°C,Iopr=6mA,t=1000HR
HIGH TEMP. HIGH UMIDITY OPERATION	Ta=60°C, HR=90%,Iopr=9mA,t=1000HR
HUMIDITY	Ta=60°C,HR=90%, t=1000HR
PCT	Ta=121°C,HR=100%, Pv=2atm, t=24HR
THERMAL SHOCK	T(L)=-55°C,T(H)=150°C, t=(L,H)=30min,M=30CYCLE
SOLDERING HEAT RESISTANCE	solder temp=250±5°C, t=10sec,REFLOW
SOLDABILITY	solder temp=230±5°C, t=5sec,dip
TERMINAL STRENGTH	TENSION 300g/30sec
SURGE	V=500V, C=200pF, R=0Ω (test method EIAJ EDX 8503)

### 6.2 CRITERION FOR JUDGING

After each reliability test, samples should be kept for at least 24 hrs at room temp. & humidity, and then measured.

The change rates should be confined within the ranges as follows.

item	OK SPEC	NG/OK
ΔRin	UNDER ±20%	OK (SPEC SATISFYING)
ΔRout	UNDER ±20%	
ΔVH	UNDER ±20%	
ΔVo/VH	UNDER ± 5%	