ChenYang
Technologies GmbH & Co. KG

CYTY300B (InSb) HALL-EFFECT ELEMENT

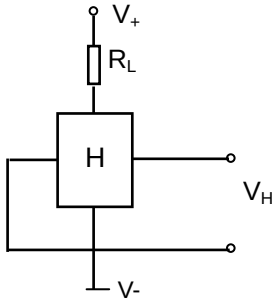
Hall-effect element CYTY300B is made of compound semiconductor material indium stibnite (InSb), which utilizes the Hall-effect principle. It can convert a magnetic flux density signal linearly into voltage output.

FEATURES

- High Magnetic Sensitivity
- Low Offset Voltage
- Miniature Package

TYPICAL APPLICATION

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



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1. Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Maximum Input Current	Imax	20 (at 25°C)	mA
Maximum Power Dissipation	Pmax	150 (at 25°C)	mW
Operating Temperature Range	Top	− 40 ~ + 110	°C
Storage Temperature Range	Tst	− 40 ~ + 125	°C

2. Electrical Characteristics (Measured at 25°C)

Parameter	Symbol	Measurement Conditions	Min	Max	Unit
Output Hall Voltage	VH	Vin = 1V, B = 50mT	196	320	mV
Input Resistance	Rin	I = 0.1mA	240	550	Ω
Output Resistance	Rout	I = 0.1mA	240	550	Ω
Offset Voltage	VO	Vin = 1V, B = 0G	− 7	+ 7	mV
Temp. Coeff. of VH	α	Ta = 0 ~ + 40°C AVG. B=50mT, Ic=5mA	-	− 1.8	% /°C
Temp. Coeff. of Rin, Rout	β	Ta = 0 ~ + 40°C AVG. B=0, Ic=0.1mA	-	− 1.8	% /°C
Dielectric strength		100V DC	1.0		MΩ

$V_H = V_{HM} - V_O$ (V_{HM} : The output voltage measured at 500G.)

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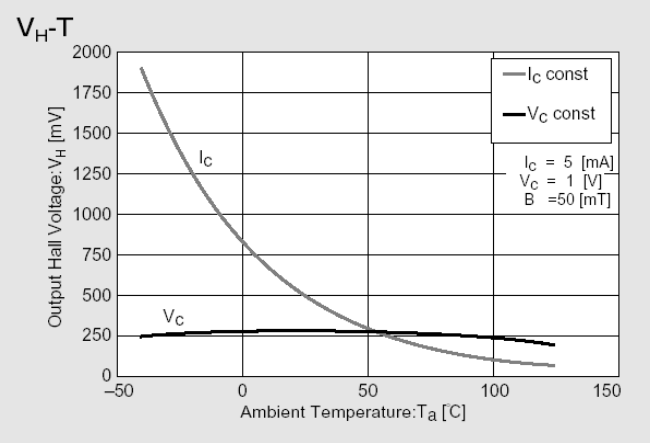
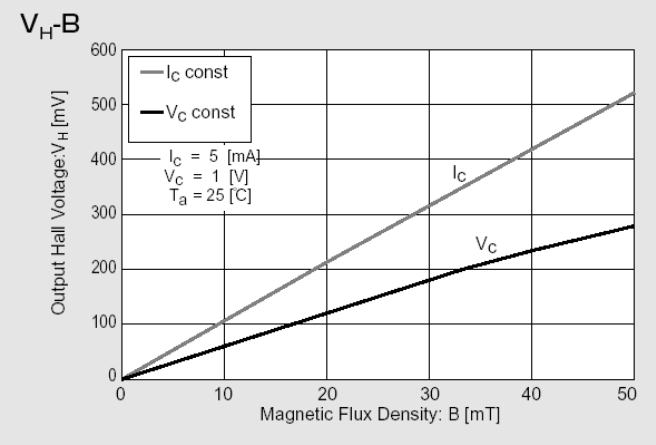
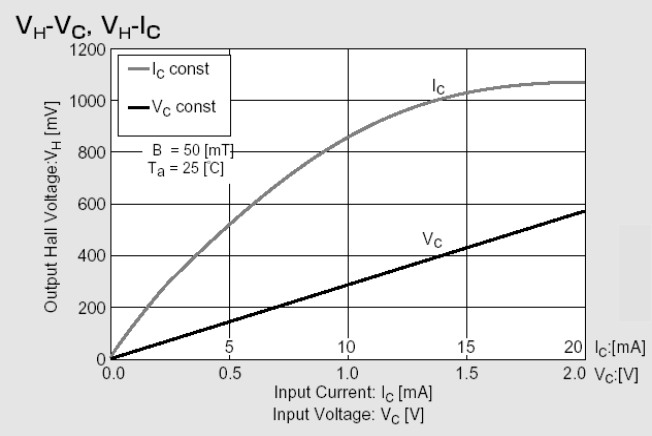
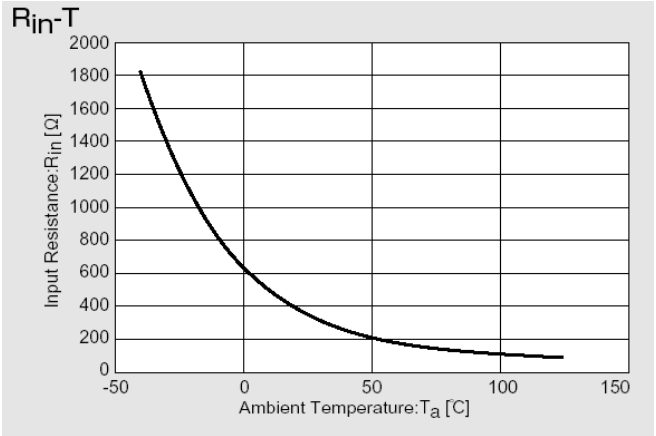
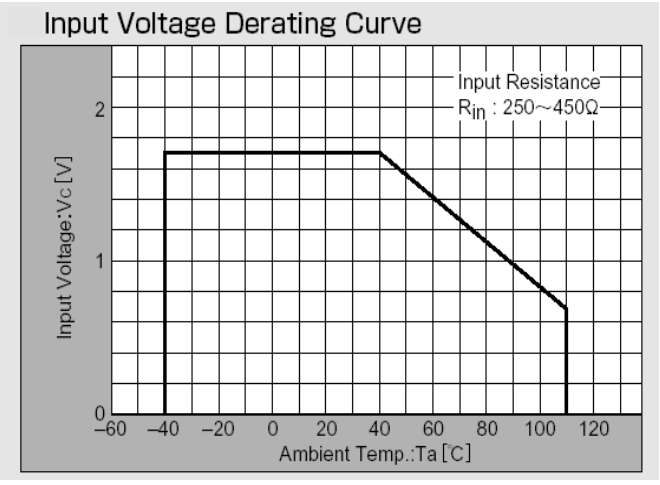
3. CHARACTERISTIC CURVES (only for references)

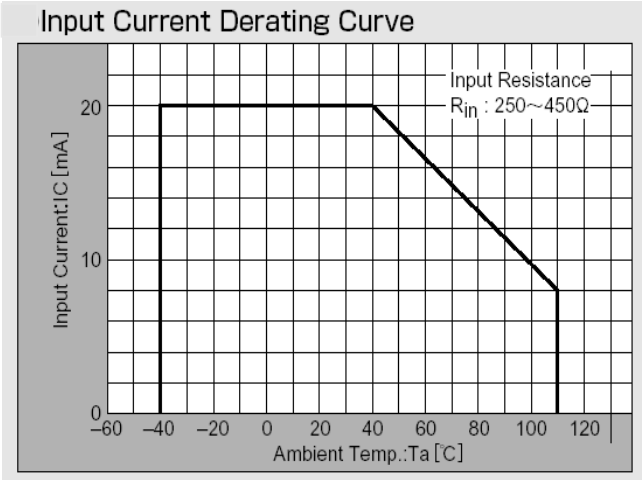












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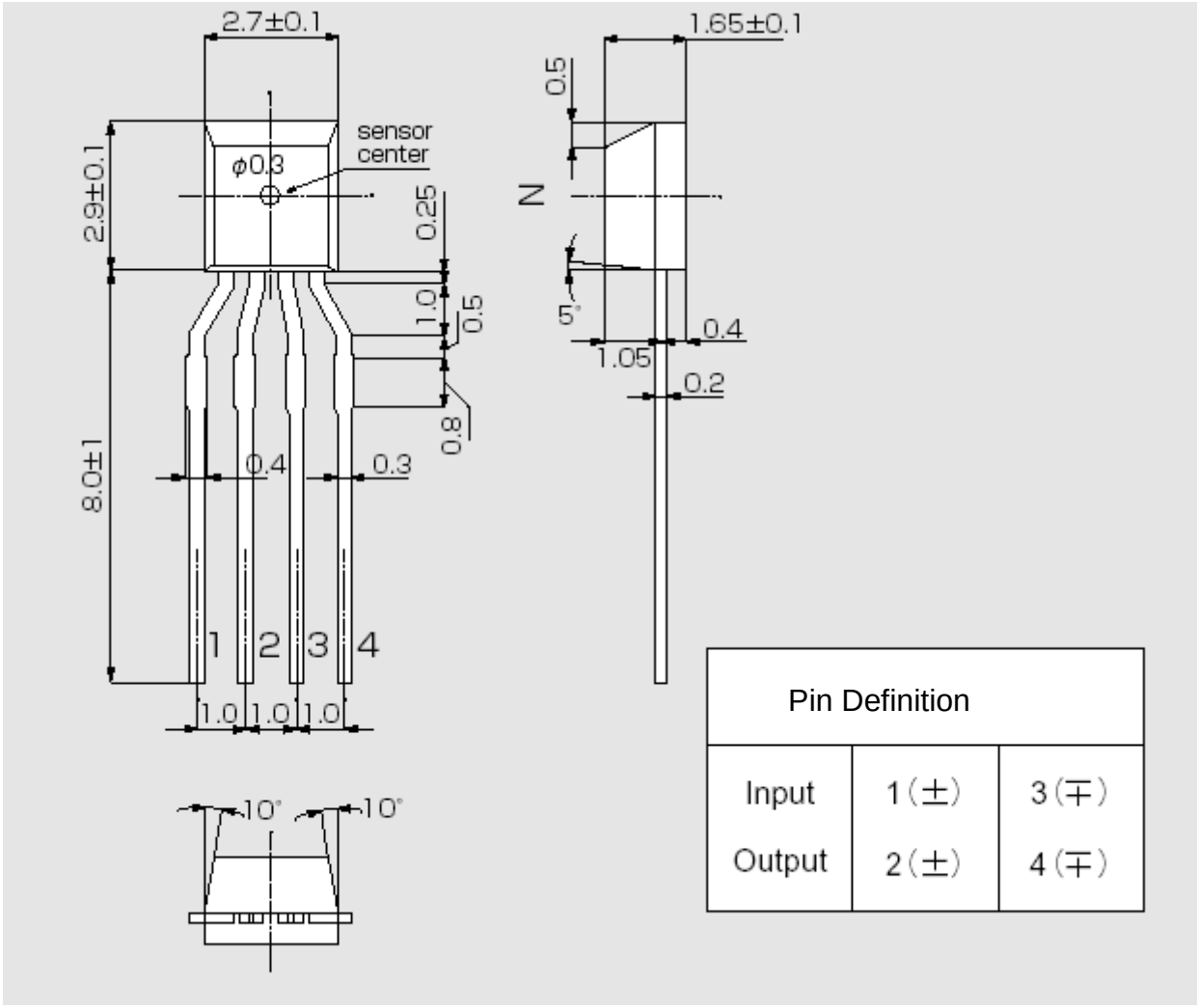
4. External Dimensions (Unit: mm)



Pin Definition		
Input	1 (±)	3 (∓)
Output	2 (±)	4 (∓)

5. Connection

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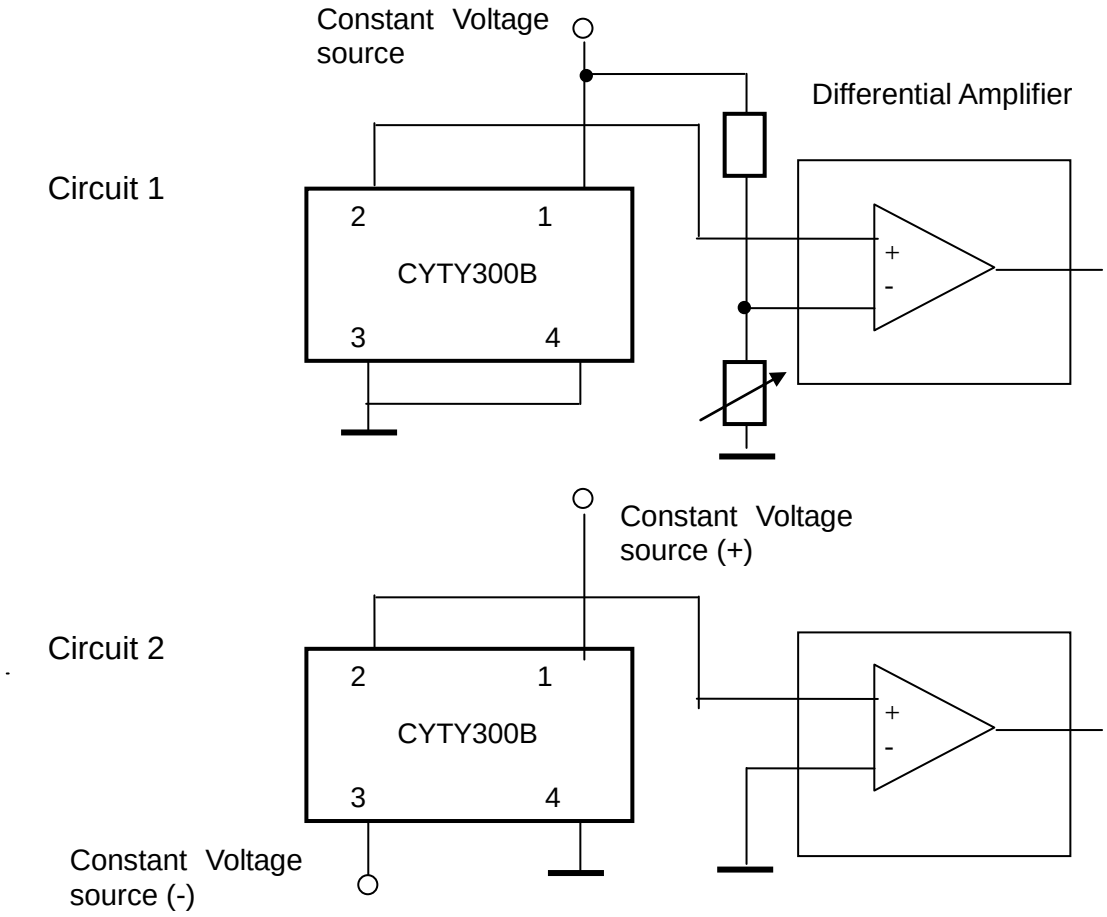

6. Application Notes

The Hall voltage V_H can be positive and negative. But if one connects the sensor as follows (circuit 1):

Pin 1: positive input voltage V+, for instance +5VDC.
Pin 3: GND
Pin 2: OUTPUT
Pin 4: GND

One can only measure the positive voltage at the pin 2. This means that the output voltage at zero magnetic field is not zero. This voltage is called as offset voltage. The output voltage in this case is not equal to the Hall voltage. The output voltage is equal to the sum of offset voltage and Hall voltage.

The offset voltage will be zero if you connect double power supplies V+ and V- to the sensor (circuit 2):

Pin 1: positive input voltage V+, for instance +5VDC.
Pin 3: negative input voltage V-, for instance -5VDC
Pin 2: OUTPUT
Pin 4: GND

In this case the output voltage is equal to the Hall Voltage.

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