



EVERLIGHT ELECTRONICS CO., LTD.

DATA SHEET

MODEL NO : HI401

DATE : MAR,24,2000

DEPARTMENT : R&D 2

REVISION : 1.0

RECEIVED			
☒ MASS PRODUCTION			
☐ PRELIMINARY			
☐ CUSTOMER DESIGN			
DEVICE NUMBER : DHI-092-009			
PAGE : 6			
CUSTOMER	DESIGNER	CHECKER	APPROVER

REV	DESCRIPTION	RELEASE DATE

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DEVICE NUMBER : DHI-092-009 REV : 1.0
ECN : _____ PAGE : 1/6

Hall Integrated Circuit

MODEL NO : HI401

■ Features :

- 4V to 20V operation.
- High reliability.
- Small size.
- Output compatible with all digital logic families.
- Reverse voltage protection.

■ Description :

- The HI401 is a magnetic sensor used in electric commutation of DC brushless motor applications mostly. The HI401 has a latching behavior and requires a magnetic north and south pole for correct function. The output does not change if the magnetic field is removed. The sensor is designed for industrial and automotive applications and operates at as low as 4 volts.

■ Applications :

- Brushless DC motor.
- Rotation detection.
- Displacement detection.
- Speed sensing.

PART	CHIP	COLOR
	MATERIAL	
HALL IC	SI	BLACK



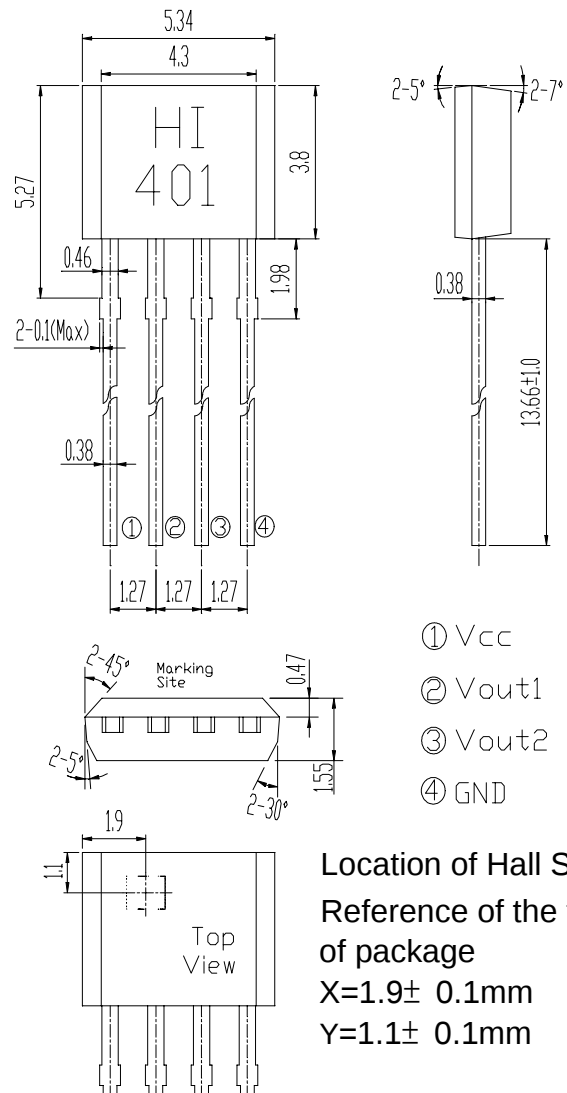
Hall Integrated Circuit

MODEL NO : HI401

■ NOTES :

1. This drawing measure is a standard value.
All dimensions are in millimeter.
2. In case of designation is toleranc $\pm$ 0.3 mm.
3. Lead spacing is measured where the leads emerge from the package.
4. Protruded resin under flange 1.0mm Max.
5. Lens color: Black.
6. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
7. These specification sheets include materials protected under copyright of EVERLIGHT corporation. Please don't reproduce or cause anyone to reproduce them without EVERLIGHT consent.
8. When using this produce, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.

■ Package Dimension :



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Hall Integrated Circuit

MODEL NO : HI401■ Absolute Maximum Ratings at $T_A = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit	Notice
Supply Voltage	V_{CC}	20	V	
Supply Current	I_{CC}	25	mA	
Output Current	I_{OUT}	Continuous 300 Hold 400 Peak(Start up) 600	mA	
Maximum Power Dissipation	P_D	500	mW	
Operating Ambient Temperature	T_A	$-20 \sim +85$	$^\circ\text{C}$	
Storage Temperature	T_{STG}	$-55 \sim +120$	$^\circ\text{C}$	
Soldering Temperature	T_{SOL}	260	$^\circ\text{C}$	1/16 inches from body for 5 seconds

■ Electronic Characteristics : $T_A = 25^\circ\text{C}$

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Supply Voltage	V_{CC}	4	---	20	V	Operating
Output Saturation Voltage	$V_{CE(SAT)}$	---	250	600	mV	$V_{CC}=14\text{V}$ $I_{OUT}=400\text{mA}$ $B>B_{OP}$
Supply Current	I_{CC}	---	18	25	mA	$V_{CC}=20\text{V}$ Output Open
Output Leakage Current	I_{LEAK}	---	---	10	μA	$V_{CE}=14\text{V}$ $V_{CC}=14\text{V}$
Output Rise Time	t_r	---	3.0	10	μS	$V_{CC}=14\text{V}$, $R_L=820\Omega$, $C_L=20\text{pF}$
Output Fall Time	t_f	---	0.3	1.5	μS	
Switch Time Differential	Δt	---	---	10	μS	

■ Magnetic Specification :

Condition: $V_{CC}=20\text{V}$, $B_S=\text{MAX}[\text{ABS}(B_{OP}), \text{ABS}(B_{RP})]$ $T_A = 25^\circ\text{C}$

Unit: Gauss

Bin Number	Bin1	Bin2	Bin3	Bin4
B_S	<70	<100	<140	<200



Hall Integrated Circuit

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■ Typical Characteristics Curves:

Fig. 1 Supply Current V.S. Supply Voltage

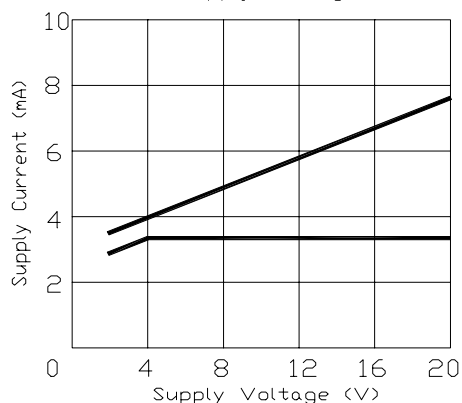


Fig. 2 Output Low Voltage V.S. Supply Voltage

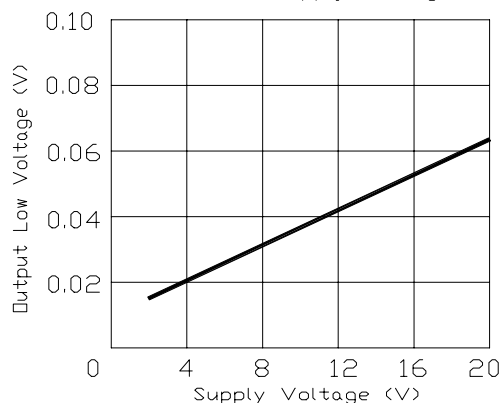


Fig. 3 Switch Points (Bop,Brp) V.S. Supply Voltage

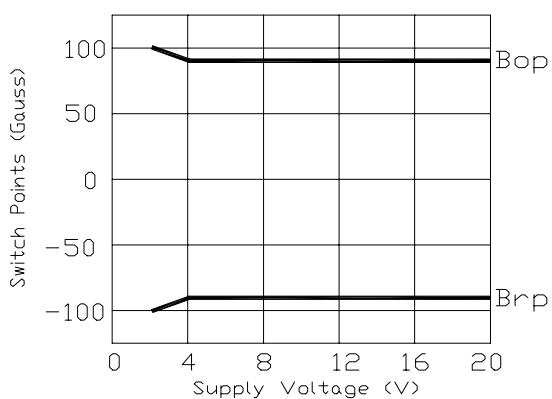


Fig. 4 Switch Points V.S. Ambient Temperature

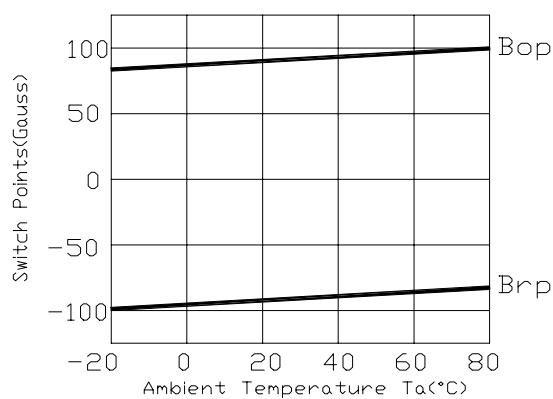


Fig. 5 Supply Current V.S. Ambient Temperature

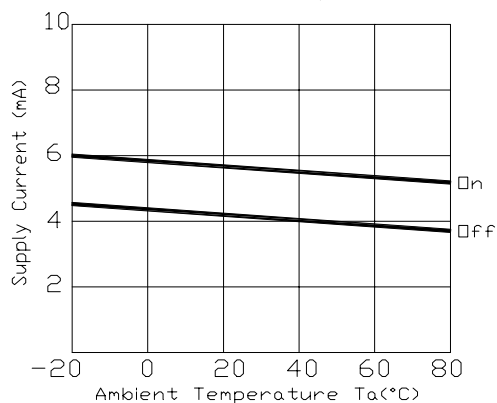
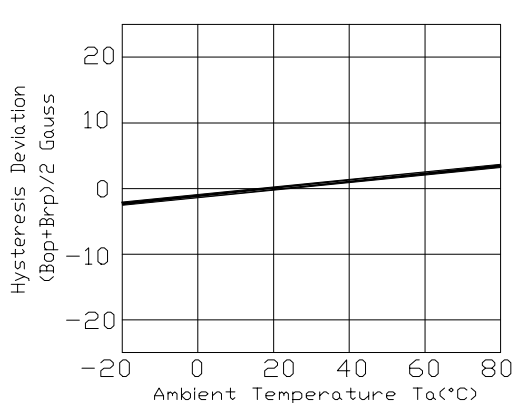


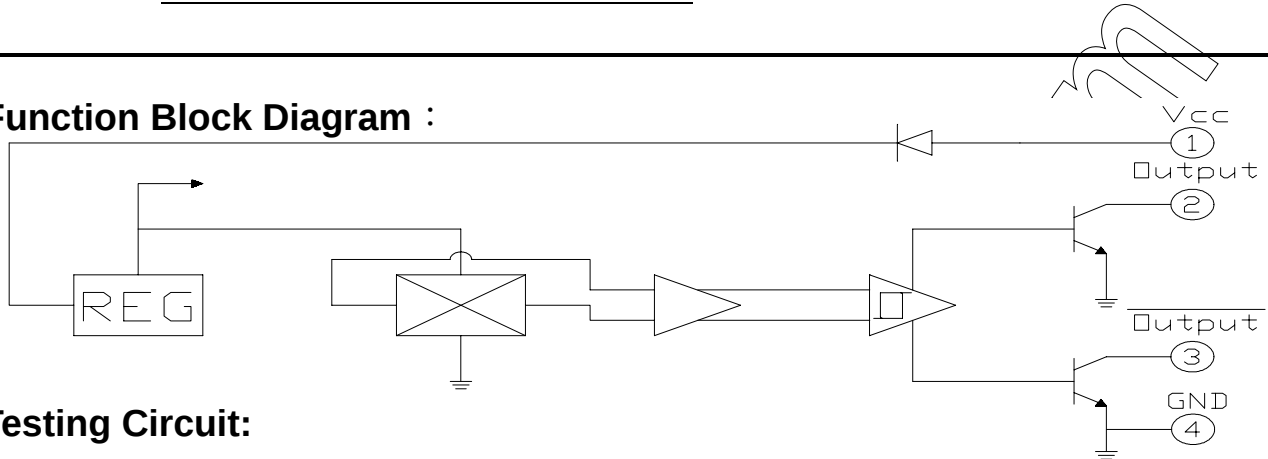
Fig. 6 Hysteresis Deviation V.S. Ambient Temperature



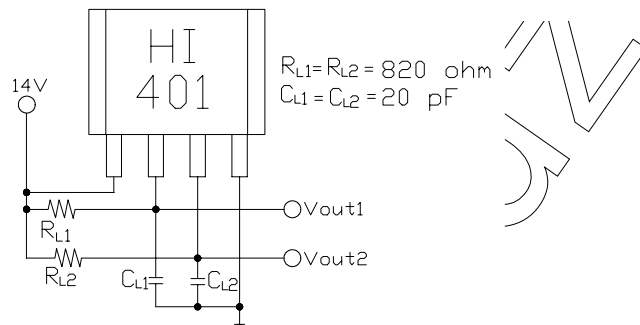
Hall Integrated Circuit

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Function Block Diagram :



Testing Circuit:



Reliability:

The reliability of products shall be satisfied with items listed below.
Confidence level : 90% ; LTPD : 10%

Test Items	Test Conditions	Failure Judgement Criteria	Samples(n)
			Defective(c)
Operation life	Vcc=12V, Ta=25°C 1000hrs	$ Bop < \pm 20\text{Gauss}$ $ Brp < \pm 20\text{Gauss}$ $0.8 \cdot L < ICC < 1.2 \cdot U$ $V_{SAT} < 1.5 \cdot U$ $I_{LEAK} < 1.5 \cdot U$ L : Lower Specification Limit U : Upper Specification Limit	n=22 , c=0
Temperature cycle	1 cycle -55°C to +85°C (30min)(5min)(30min) 50 cycle test		n=22 , c=0
Thermal shock	-10°C to +100°C (5min) (10sec) (5min) 50 cycle test		n=22 , c=0
High temperature storage	Temp : +150°C 1000hrs		n=22 , c=0
Low temperature storage	Temp : -55°C 1000hrs		n=22 , c=0
High temperature High humidity	TA : 85°C RH : 85% 1000hrs		n=22 , c=0
Solder heat	Temp : 260 ± 10°C sec 4mm from the bottom of the package		n=22 , c=0



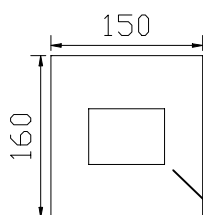
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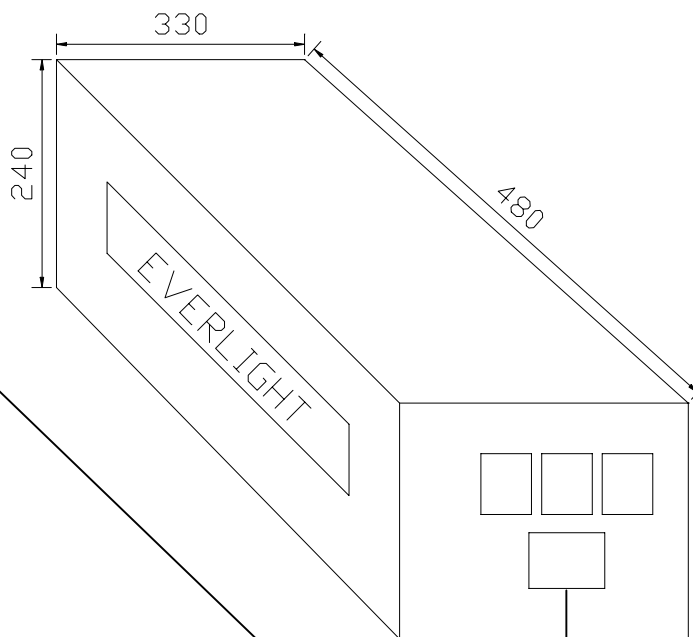
■ Packing Specifications:

(UNIT: mm)

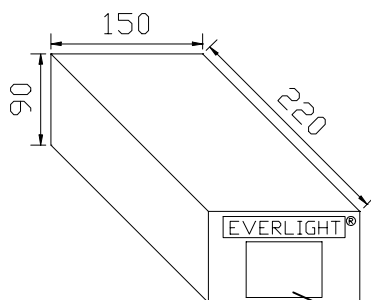
1.Bag:



3.Carton:



2.Box:



■ Packing Quantity Specification:

- 1.1000Pcs/1Bag,10Bags/1Box
- 2.10Boxes/1Carton

■ Label Specification:

CPN : Customer's Production Number
P/N : Production Number
QTY : Packing Quantity
CAT : Ranks
HUE : Reference
REF : Reference
LOT NO : Lot Number
MADE IN TAIWAN : Production Place

Label

EVERLIGHT

CPN:

P/N:



HI401

QTY:



LOT NO:

CAT:

HUE:

REF:

MADE IN TAIWAN