General Purpose Hall Effect Latch

DESCRIPTION

TSH181 Hall-Effect sensor is designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall Voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open collector output. An internal band gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range. The device is identical except for magnetic switch points. The device includes on a single silicon chip a voltage regulator, Hall-voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, open-collector output to sink up to 25mA. A south pole of sufficient strength will turn the output on. The North Pole is necessary to turn the output off. An on-board regulator permits operation with supply voltages of 3.5V to 20V

FEATURES

- Temperature compensation.
- Wide operating voltage range.
- Open-Collector pre-driver.
- Reverse bias protection on power supply pin.
- 100% at 125°C “Hot Test”
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

APPLICATION

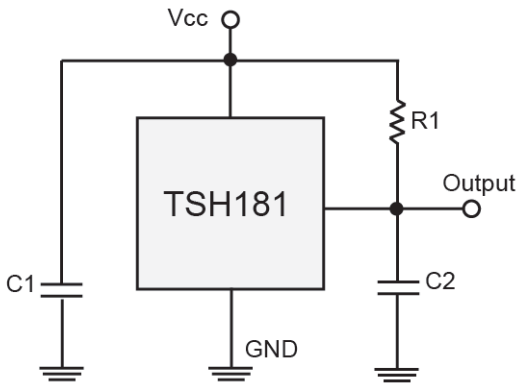
- High temperature Fan motor
- 3 phase BLDC motor application
- Fan motor application
- Speed sensing
- Revolution counting

Pb-Free RoHS COMPLIANT HALOGEN FREE

TO-92S

Pin Definition:
1. V_{CC}
2. Ground
3. Output

TYPICAL APPLICATION CIRCUIT



C1：1000pF
C2：15pF
R1：10kΩ

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Supply voltage	V_{CC}	20	V
Output Voltage	V_{OUT}	30	V
Reverse voltage	$V_{CC/OUT}$	-20	V
Magnetic flux density		Unlimited	Gauss
Output current	I_{OUT}	25	mA
Operating Temperature Range	T_{OPR}	-40 to +125	°C
Storage temperature range	T_{STG}	-55 to +150	°C
Supply voltage	T_J	150	°C
Package Power Dissipation	P_D	606	mW

Note: Do not apply reverse voltage to V_{CC} and V_{OUT} Pin, It may be caused for Miss function or damaged device

THERMAL PERFORMANCE			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Thermal Resistance - Junction to Case	$R_{\Theta JC}$	148	°C/W
Thermal Resistance - Junction to Ambient	$R_{\Theta JA}$	206	°C/W

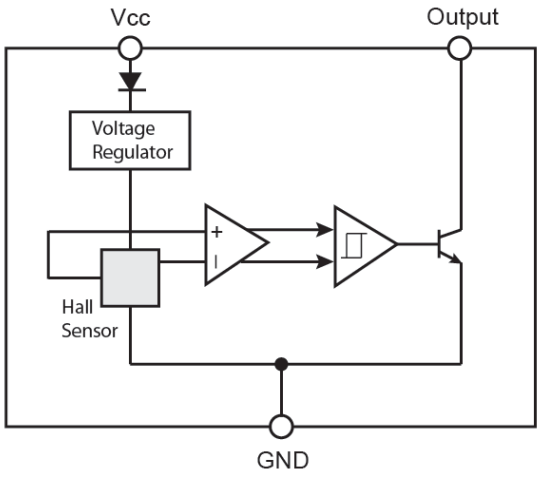
ELECTRICAL SPECIFICATIONS (DC Operating Parameters：T_A=25°C, V_{CC}=12V)					
PARAMETER	**CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNIT**
Supply Voltage	Operating	3.5	--	20	V
Supply Current	B< B_{OP}	--	4	8	mA
Output Saturation Voltage	I_{OUT} = 10mA, B>B_{OP}	--	--	700	mV
Output Leakage Current	I_{OFF} B<B_{RP}, V_{OUT} = 12V	--	--	10	μA
Output Rise Time	R_L = 820Ω, C_L = 20pF	--	--	1.5	μs
Output Fall Time	R_L = 820Ω; C_L = 20pF	--	--	1.5	μs
Operate Point		5	--	90	Gauss
Release Point		-90	--	-5	Gauss
Hysteresis		--	100	--	Gauss

Note: 1G (gauss) = 0.1mT (millitesla)

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
TSH181CT B0G	TO-92S	1Kpcs / Bulk Bag

BLOCK DIAGRAM



OUTPUT BEHAVIOR vs. MAGNETIC POLE

DC Operating Parameters: T_A = -40 to 125°C, V_{CC} = 3.5V ~ 20V

PARAMETER	TEST CONDITION	OUT
North pole	B>B_{OP}	Open
South pole	B<B_{RP}	Low

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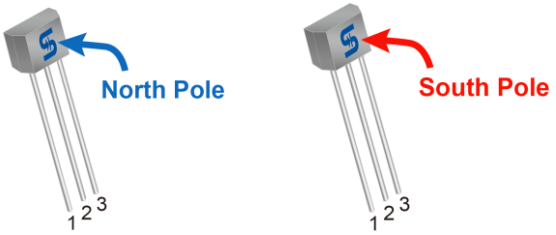
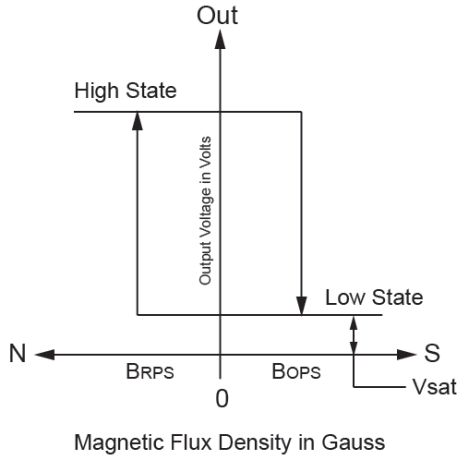


OUT=Open
(Pull-up Voltage)

OUT=Low
(VDSon)



CHARACTERISTIC PERFORMANCE

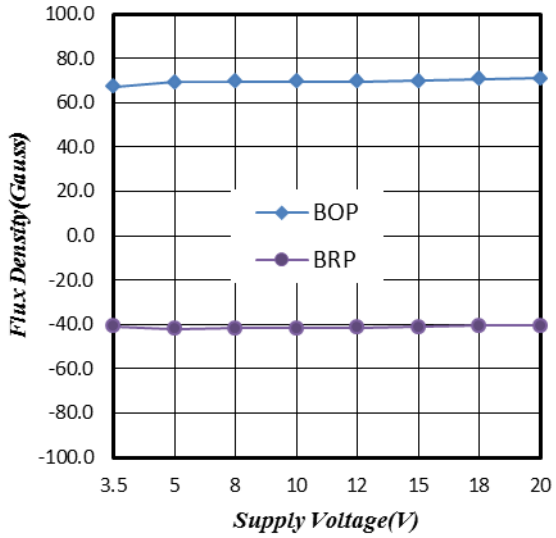


Figure 1. Supply Voltage vs. Flux Density

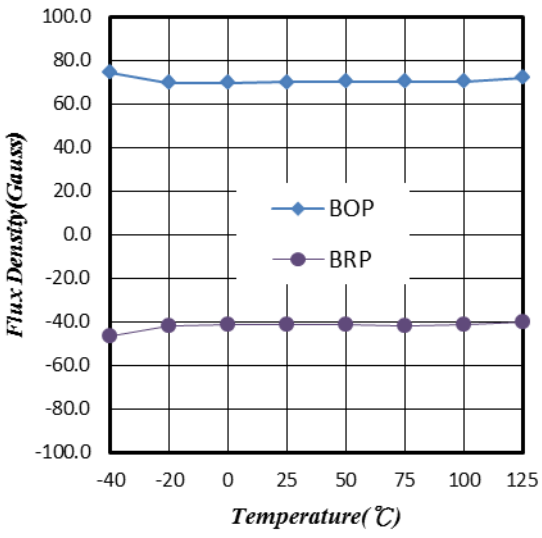


Figure 2. Temperature vs. Flux Density

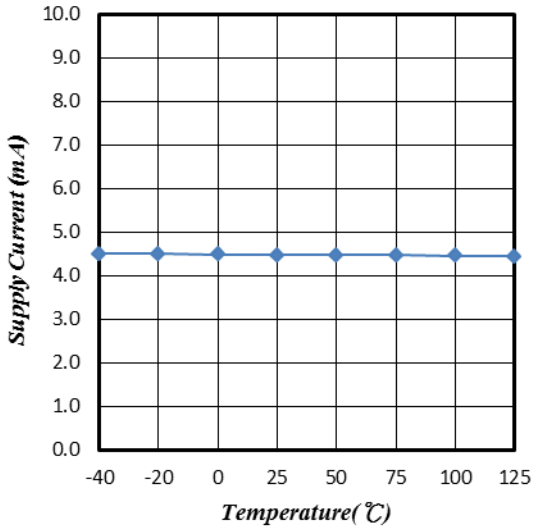


Figure 3. Supply Voltage vs. Output Voltage

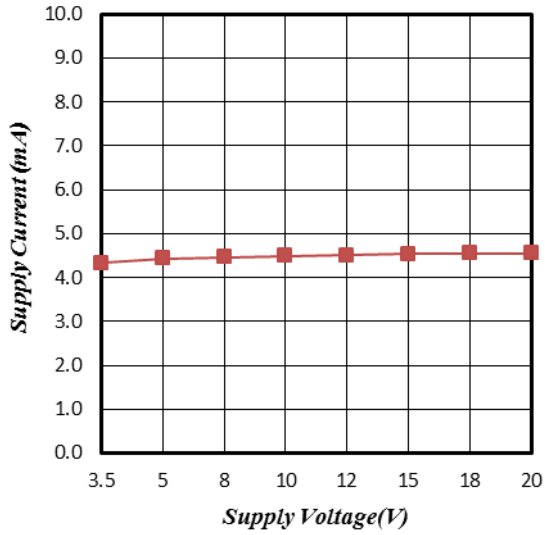


Figure 4. Temperature vs. Output Voltage

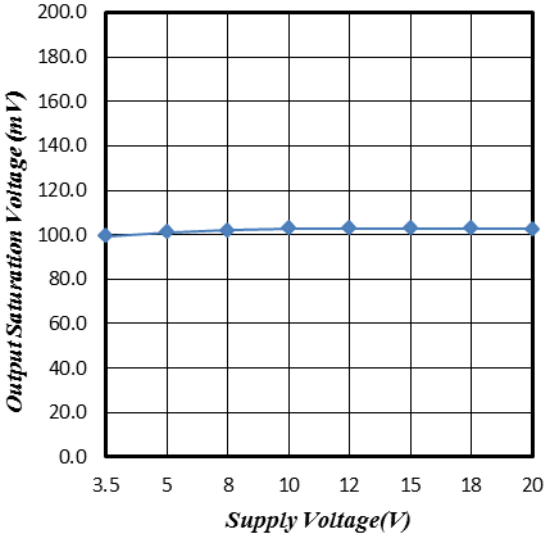


Figure 5. Supply Voltage vs. Leakage Current

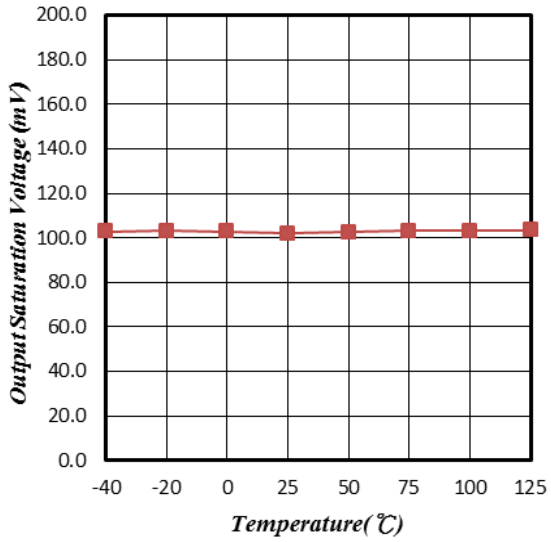


Figure 6. Power Dissipation vs. Temperature

CHARACTERISTIC PERFORMANCE (CONTINUE)

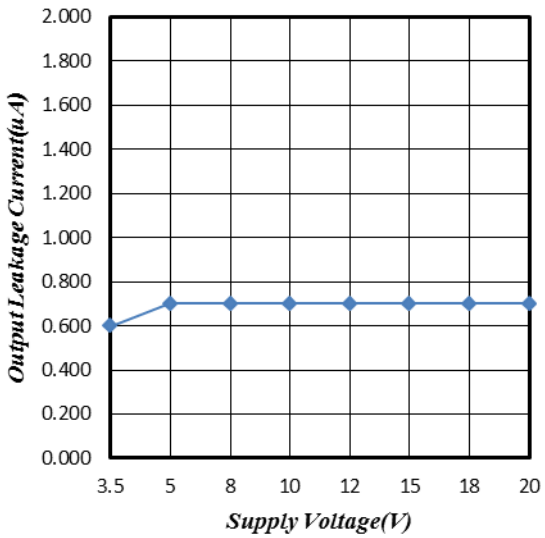


Figure 7. Temperature vs. Supply Current

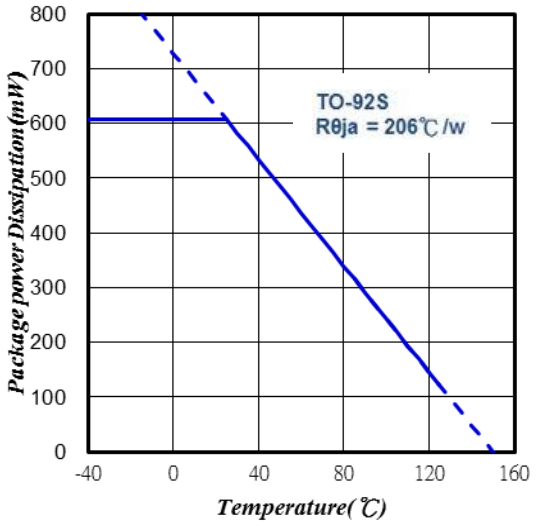


Figure 8. Temperature vs. Power Dissipation

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

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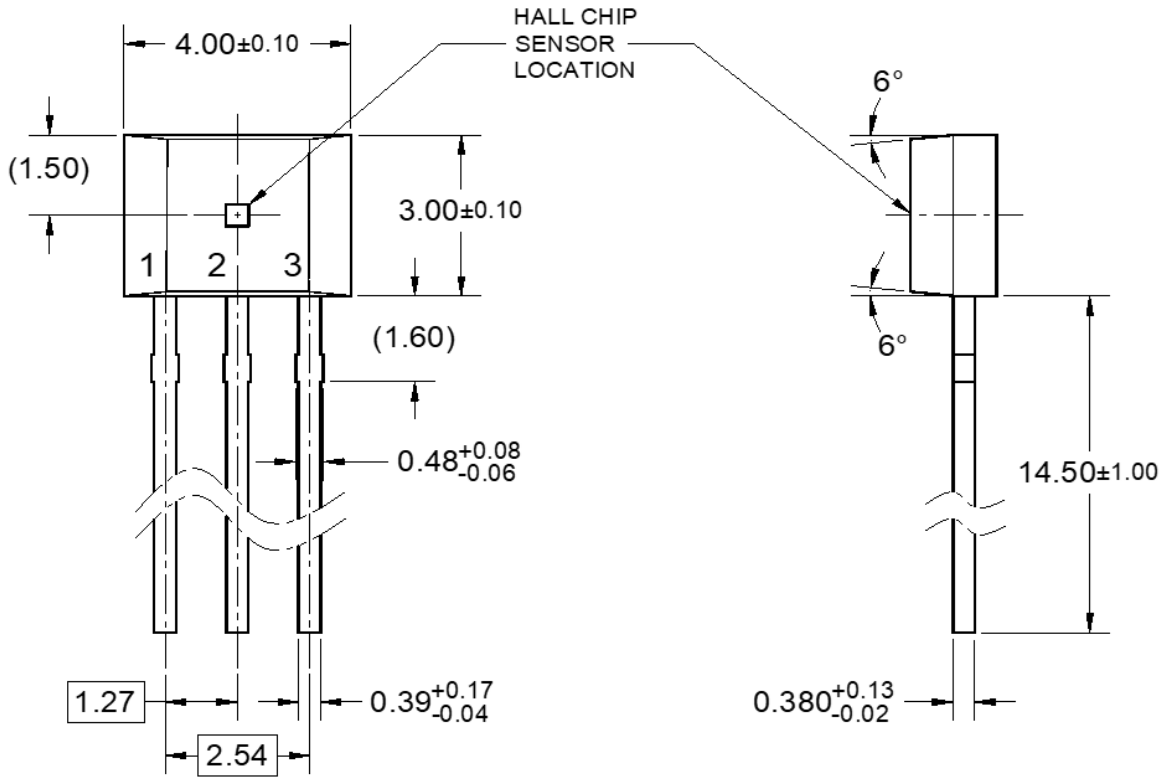
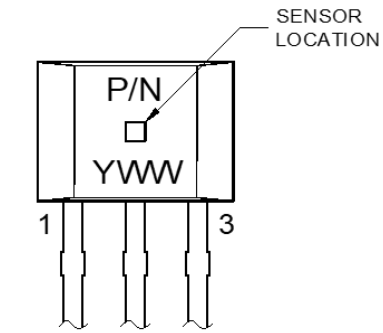
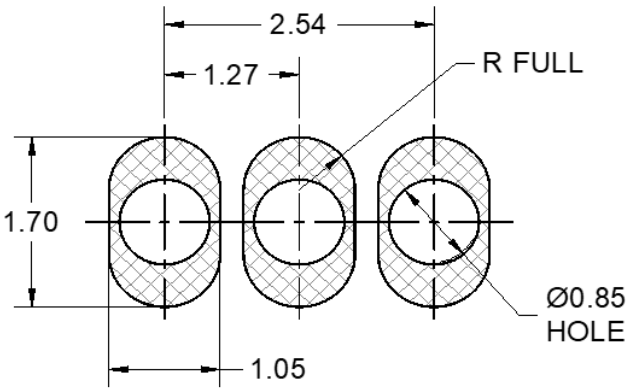




MARKING DIAGRAM

P/N = 181
Y = Year Code
WW = Week Code (01~52)



SUGGESTED PAD LAYOUT
(SCALE: 2X)

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. DWG NO REF: HQ2SD07-TO92S-010 REV A.

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