



Pin Definition:

- 1. V_{DD}
- 2. GND
 3. Output

Description

TSH181, Hall-Effect sensor, 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 20 V.

Features

- Temperature compensation.
- Wide operating voltage range.
- Open-Collector pre-driver.
- Reverse bias protection on power supply pin.
- 100% at 125°C "Hot Test"

Application

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

Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

Characteristics	Limit	Value	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	Ι _{ουτ}	25	mA
Operating Temperature Range	T _{OPR}	-40 to +125	°C
Storage temperature range	T _{STG}	-55 to +150	°C
Maximum Junction Temp	TJ	150	°C
Thermal Resistance - Junction to Ambient	θ_{JA}	206	°C/W
Thermal Resistance - Junction to Case	θ _{JC}	148	°C/W
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.

Ordering Information

Part No.	Package	Packing
TSH181CT B0G	TO-92S	1Kpcs / Bulk Bag

Note: "G" denote for Halogen Free Product



Block Diagram



Typical Application Circuit



Electrical Specifications (DC Operating Parameters : T_A=+25°C,V_{CC}=12V)

Parameters	Test Conditions	Min	Тур	Max	Units
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<sub>RP, V_{OUT} = 12V</b<sub>			10	uA
Output Rise Time	$R_L=820\Omega, C_L=20pF$			1.5	uS
Output Fall Time	$R_L=820\Omega; C_L=20pF$			1.5	uS



Magnetic Specifications

Parameters	Test Conditions	Min	Тур	Max	Units
Operate Point		5		90	Gauss
Release Point		-90		-5	Gauss
Hysteresis			100		Gauss

Note: 1G (Gauss) = 0.1mT (millitesta)

Output Behavior versus Magnetic Pole

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

Parameter	Test condition	OUT
North pole	B>B _{OP}	Open
South pole	B <b<sub>RP</b<sub>	Low





Characteristic Performance



Figure 1. Supply Voltage vs. Flux Density



Figure 3. Supply Voltage vs. Output Voltage



Figure 5. Supply Voltage vs. Leakage Current



Figure 2. Temperature vs. Flux Density



Figure 4. Temperature vs. Output Voltage



Figure 6. Power Dissipation vs. Temperature



Characteristic Performance



Figure 7. Temperature vs. Supply Current



Figure 8. Temperature vs. Power Dissipation



TO-92S Mechanical Drawing





Unit: Millimeters

Marking Diagram



181 = Device Code

1.52 ±0.10

- Y = Year Code
- WW = Week Code (01~52)



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