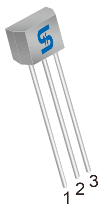
TSH481

Ratio-metric Linear Hall Effect Switch

TO-92S



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

Description

TSH481 is a linear Hall-effect sensor which is composed of Hall sensor, linear amplifier and Totem-Pole output stage. It features low noise output, which makes it unnecessary to use external filtering. It also can provide increased temperature stability and accuracy. The linear Hall sensor has a wide operating temperature range of -40 °C to +105 °C, appropriate for commercial, consumer, and industrial environments.

The high sensitivity of Hall-effect sensor accurately tracks extremely weak changes in magnetic flux density. The linear sourcing output voltage is set by the supply voltage and in proportion of variation of the magnetic flux density. Typical operation current is 2.5mA and operating voltage range is 3.0V to 6.5V

Features

- Operating Voltage Range: 3.0V~6.5V
- Low-Noise Operation
- Linear output for circuit design flexibility
- Totem-Pole for a stable and accurate output
- Responds to either positive or negative magnetic flux density
- Robust ESD performance

Ordering Information

Part No.	Package	Packing
TSH481CT B0G	TO-92S	1kpcs / Bulk Bag

Note: "G" denote for Halogen Free Product

Application

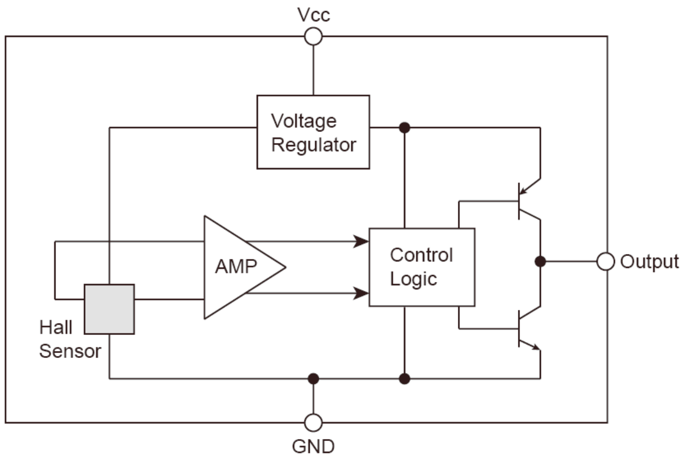
- Current sensing
- Motor control
- Position sensing
- Magnetic code reading
- Rotary encoder
- Ferrous metal detector
- Vibration sensing
- Liquid level sensing
- Weight sensing

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

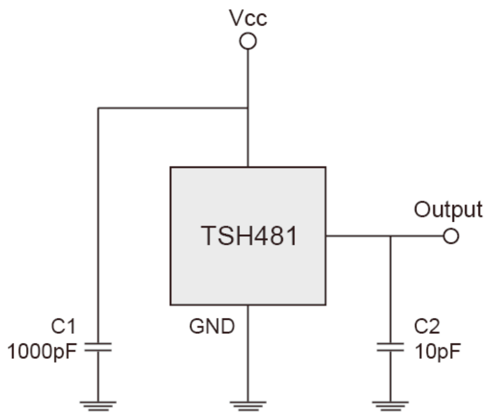
Characteristics	Limit	Value	Unit
Supply voltage	V_{CC}	8	V
Reverse voltage	V_{CC}	-0.5	V
Magnetic flux density		Unlimited	G
Output current	I_{OUT}	10	mA
Operating Temperature Range	T_{OPR}	-40 to +85	°C
Storage temperature range	T_{STG}	-65 to +150	°C
Maximum Junction Temp	T_J	150	°C
Thermal Resistance - Junction to Ambient	$R\theta_{JA}$	206	°C/W
Thermal Resistance - Junction to Case	$R\theta_{JC}$	148	°C/W
Package Power Dissipation	P_D	606	mW

Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

Block Diagram



Typical Application Circuit



Electrical Specifications (DC Operating Parameters: T_A=+25°C,V_{CC}=5V)

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage	Operating	3.0	--	6.5	V
Supply Current	B=0 G	--	2.5	5.0	mA
Output Current	V_{CC}>3V	1.0	1.5	--	mA
Null Output Voltage	B=0 G	2.3	2.5	2.7	V
Output Bandwidth		--	20	--	kHz
Output Voltage Span		2.95	3.2	--	V
Magnetic Range Gauss		±500	±800	--	G
Linearity	% of Span	--	0.7	--	
Response Time		--	3	--	µs
Sensitivity		1.8	--	2.2	mV/G
Electro-Static Discharge	HBM	3	--	--	kV

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

Output Behavior versus Magnetic Pole

DC Operating Parameters: T_A=+25°C, V_{CC}=5V

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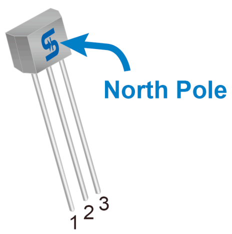
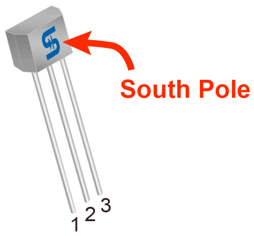
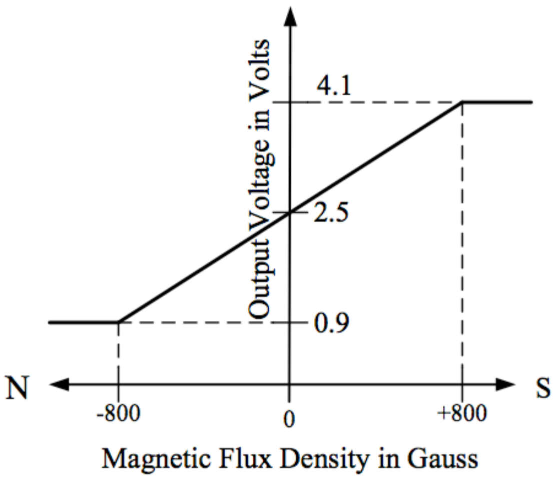
	
$V_{OUT} < V_{NULL}$	$V_{OUT} > V_{NULL}$



Characteristic Performance

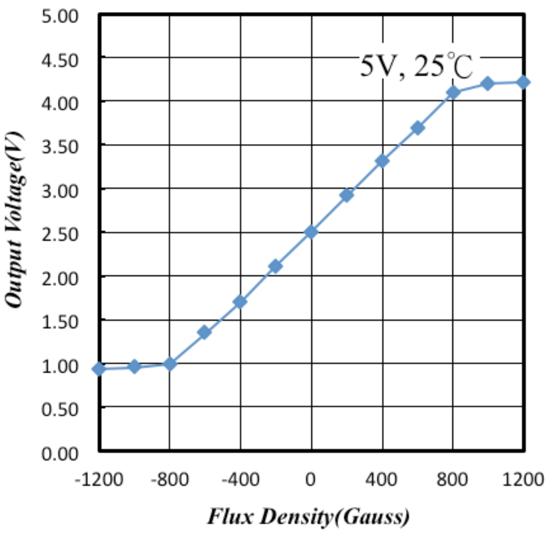


Figure 1. Output Voltage vs. Flux Density

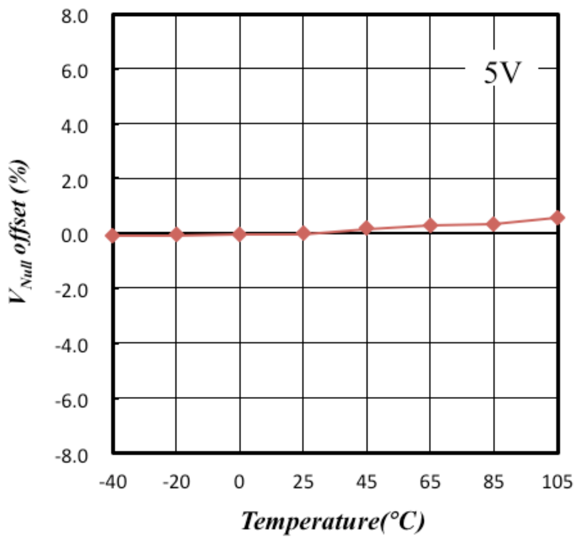


Figure 2. Output Voltage Offset vs. Temperature

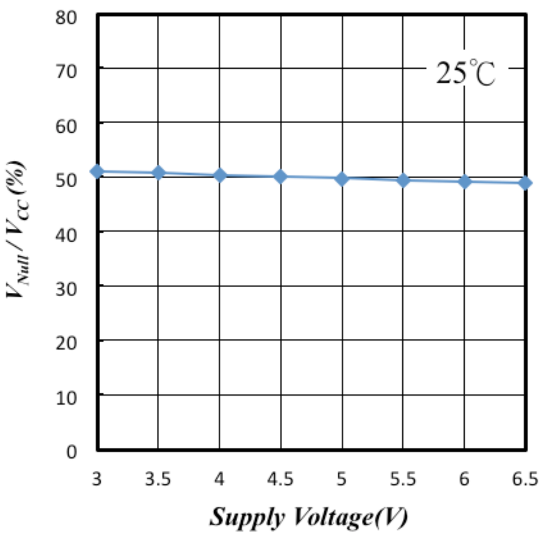


Figure 3. Vout/Vcc Ratio vs. Supply Current

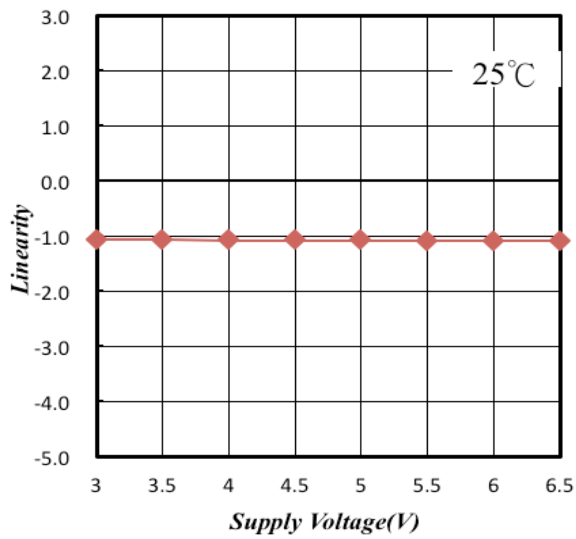


Figure 4. Linearity vs. Supply Voltage

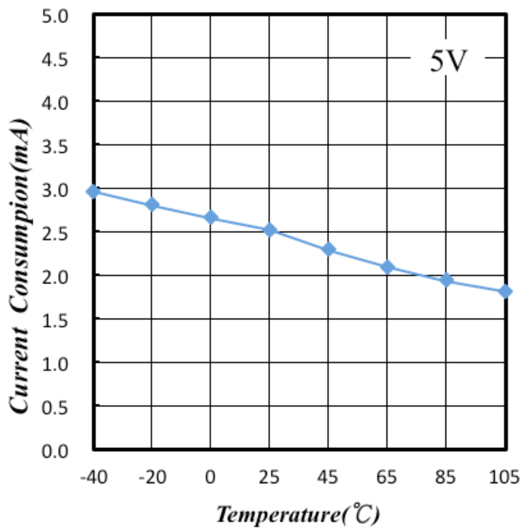


Figure 5. Supply Current vs. Temperature

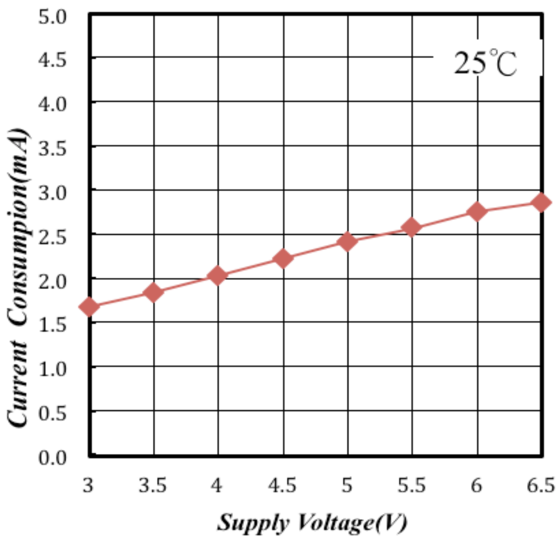


Figure 6. Supply Current vs. Supply Voltage

Characteristic Performance

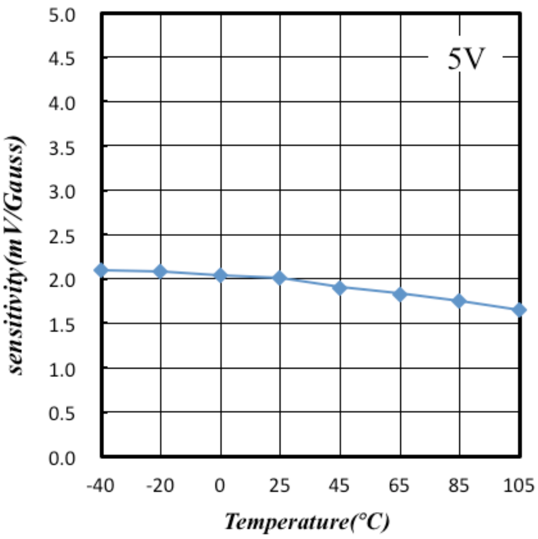


Figure 7. Sensitivity vs. Temperature

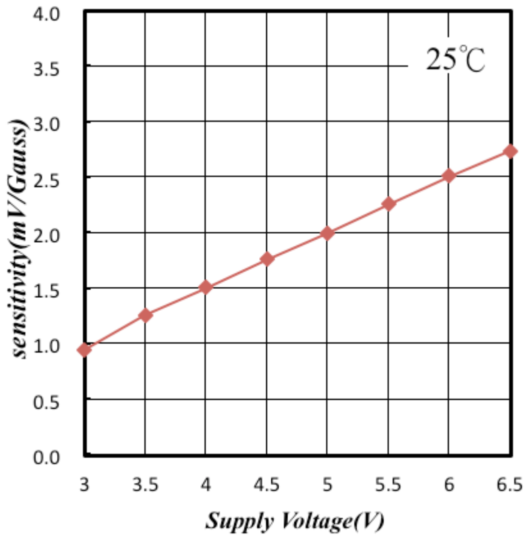


Figure 8. Sensitivity vs. Supply Voltage

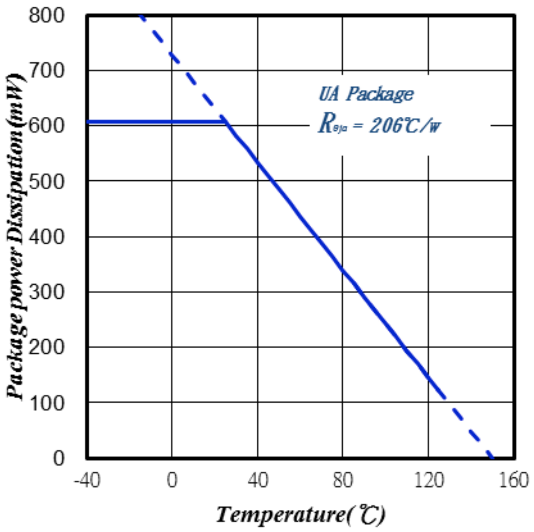
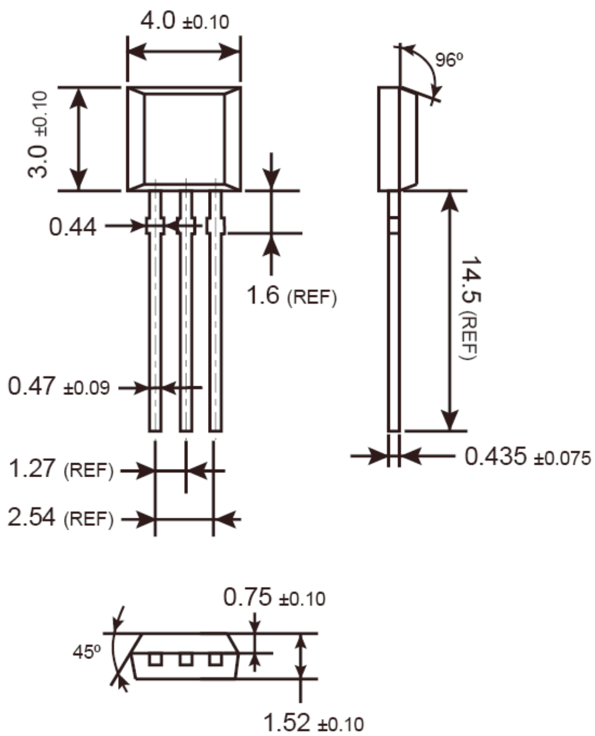
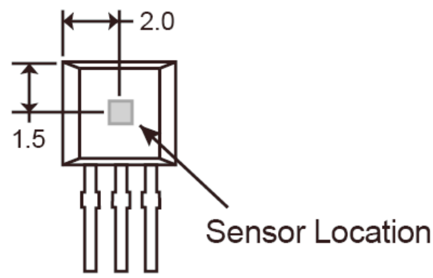


Figure 8. Power Dissipation vs. Temperature

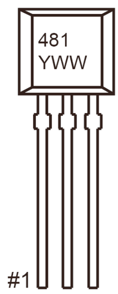
TO-92S Mechanical Drawing





Unit: Millimeters

Marking Diagram



481 = Device Code
Y = Year Code (3=2013, 4=2014….)
WW = Week Code (01~52)

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