

Single Hall Effect Sensor

Features

- Wide operating voltage range: 3.0V to 28V
- Maximum output sink current 50mA
- Open-Collector pre-driver
- Power reverse polarity protection
- Available in SIP-3L package



General Description

The FS177N is an integrated 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 bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

A north pole of sufficient strength will turn the output ON. In the absence of a magnetic field, the output is OFF.

Block Diagram

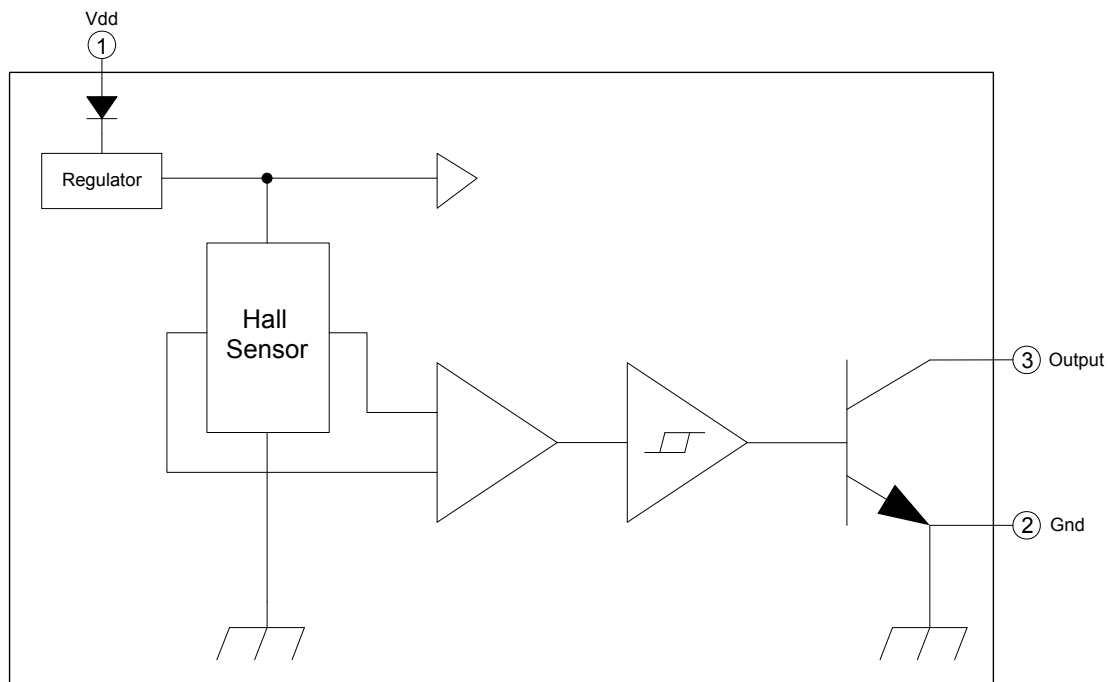


Figure.1

Pin Connection

[Top View]

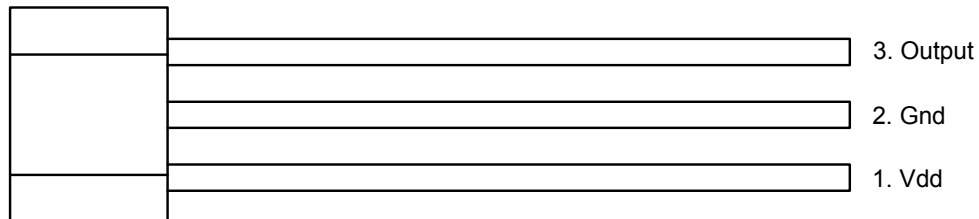


Figure.2

Pin Descriptions

Name	I/O	Pin No.	Description
Vdd	P	1	Positive power supply
Gnd	G	2	Ground
Output	O	3	Driver output

Legend: I=input, O=output, I/O=input/output, P=power supply, G=ground

Functional Application Circuit

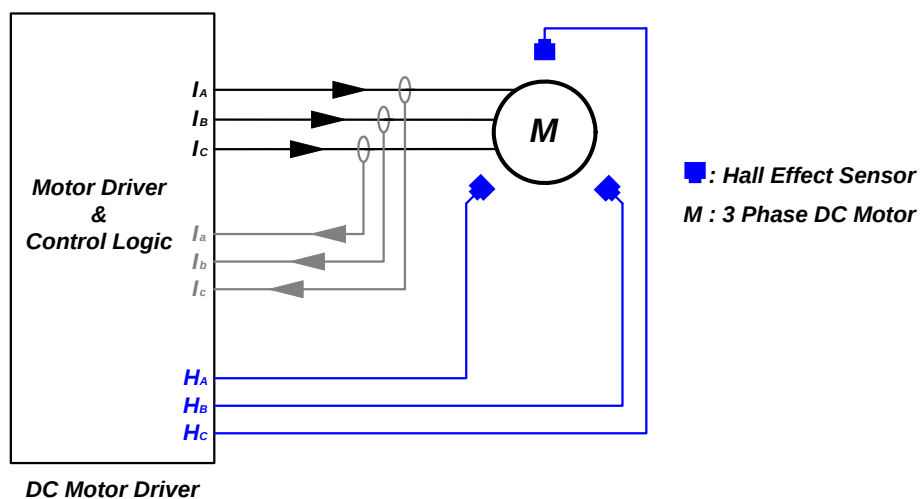
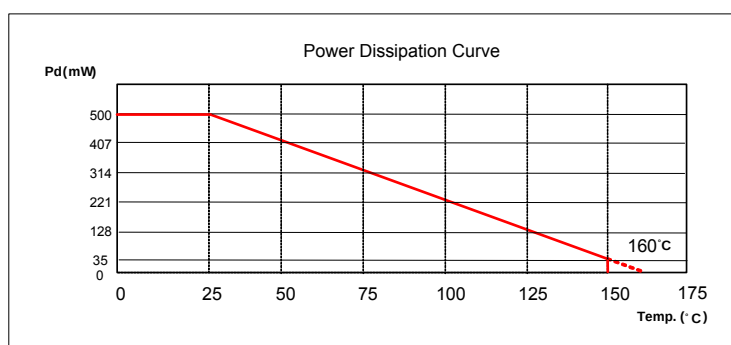
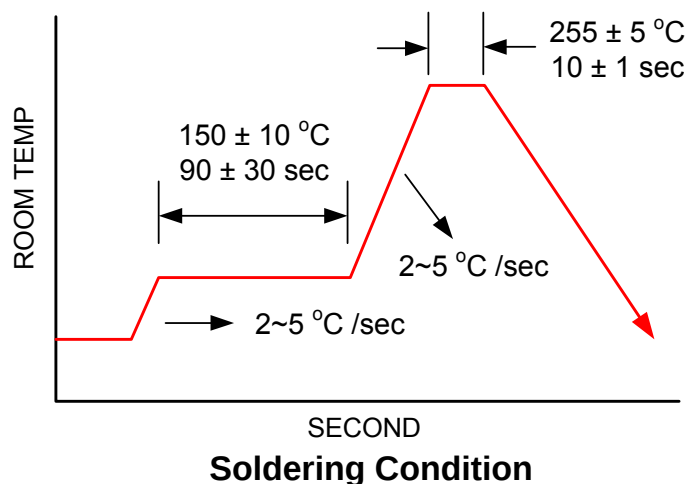


Figure.3

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operating Temperature	T_{OP}	-	-40		150	°C
Storage Temperature	T_{ST}	-	-65		150	°C
DC Supply Voltage	V_{DD}	-	3.0		28	V
Supply Current	I_{DD}	-			10	mA
Continuous Current	$I_{O(CONT)}$				50	mA
Junction temperature	T_J				160	°C
Power Dissipation	P_D	SIP-3L			500	mW
Thermal Resistance	θ_{JC}	SIP-3L		0.27		°C/mW
Lead Temperature		10sec			260	°C


Figure.4

Figure.5

Recommended Operating Conditions

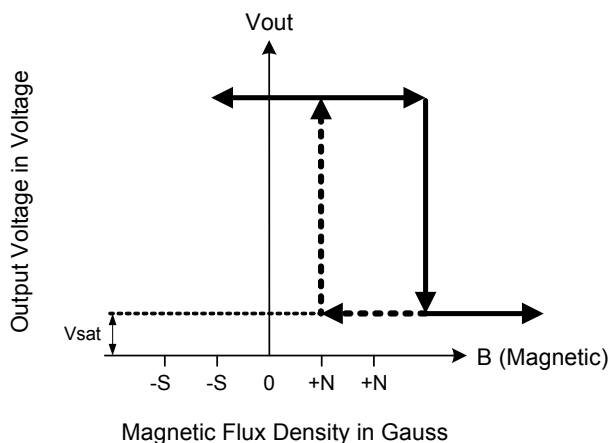
Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Supply Voltage	V_{DD}	-	3.0		28	V
Operating Temperature Range	T_A	-	-40		150	°C

Electrical Characteristics $V_{DD}=12.0V$, $T_A=25^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Average Supply Current(no load)	I_{DD}	-		3.5	10	mA
Output Saturation Voltage	V_{SAT}	$I_{out}= 20mA$		165	200	mV
Output Rise time	t_r	$R_L=500\Omega$, $C_L=20pF$ (Figure 7)	0.2	-	0.75	μs
Output Fall time	t_f	$R_L=500\Omega$, $C_L=20pF$ (Figure 7)	20	-	150	ns

Magnetic Characteristics

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Operate Points	B_{OP}		+140	-	-	G
Release Points	B_{RP}		-	-	+60	G
Hysteresis	B_{HYST}		30	-	120	G

Hysteresis Characteristics

Figure.6

Test Circuit

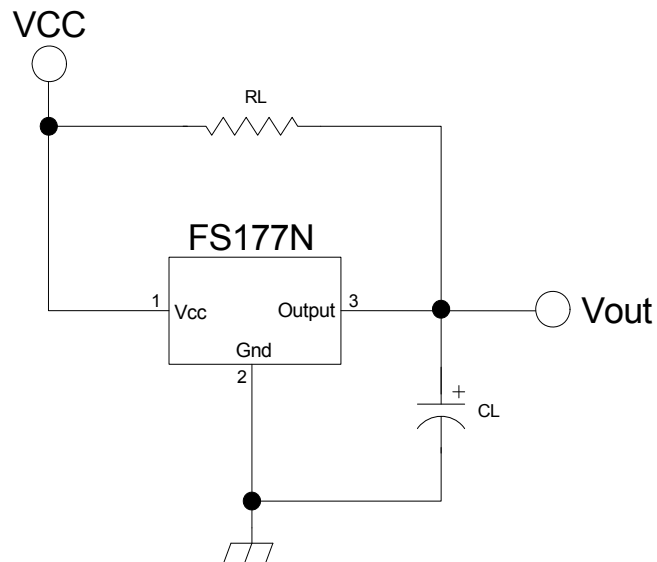


Figure.7

Marking Information

[Top View]

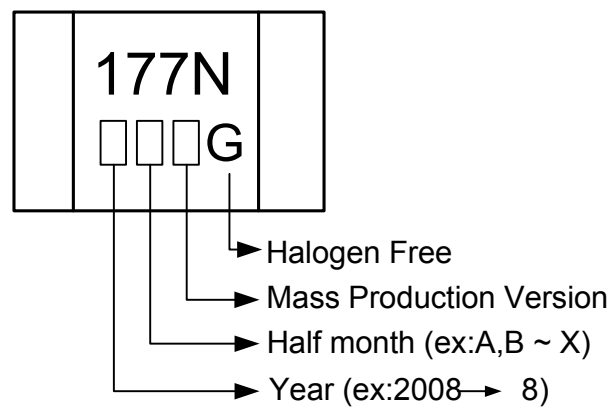
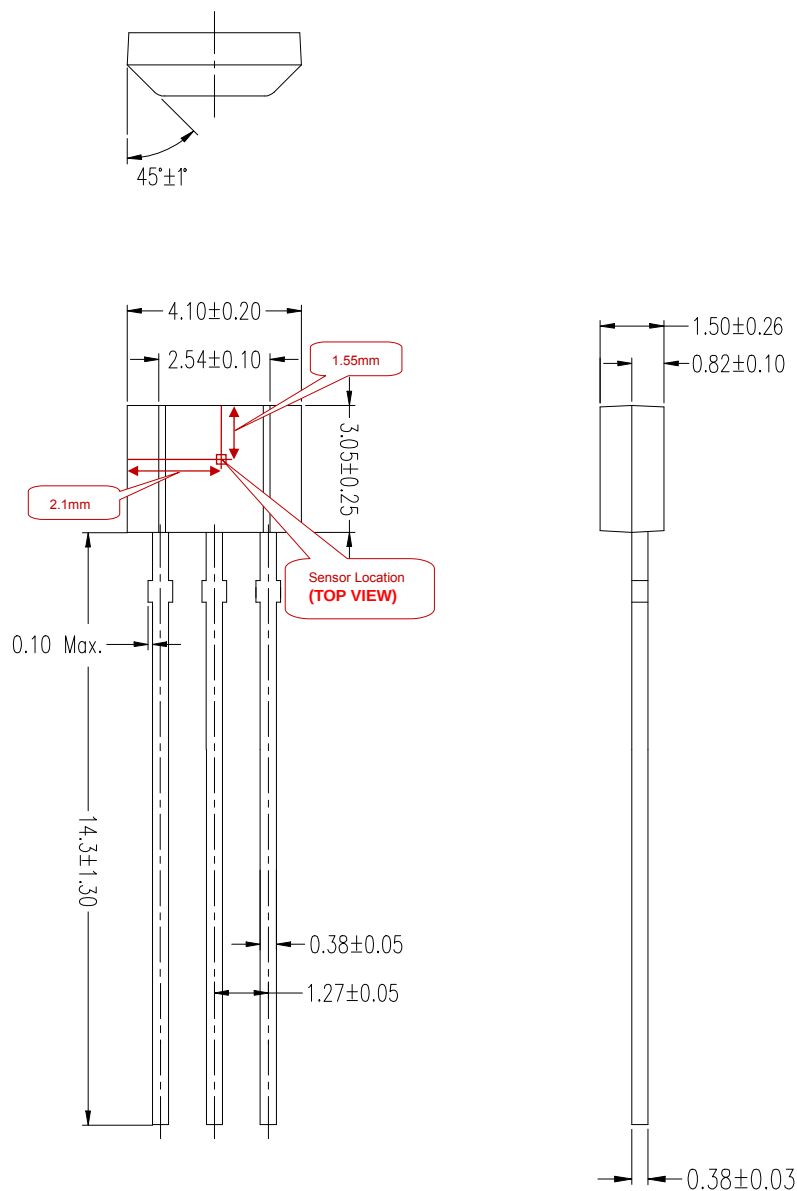


Figure.8

Package Dimension (Unit: mm)
SIP-3L(Halogen Free)



Order Information

Part Number	Operating Temperature	Package	MOQ
FS177NG1	-40 °C to +150 °C	SIP-3L	1000ea