

General Description

The SDC177 is a latching switch Hall IC. It's composed of power reverse protection circuit, high stable voltage regulator, Hall voltage generator, a differential amplifier, Schmitt trigger and open collector output. Change of magnetic field can be converted into digital signal. It can be used for brushless DC motors, brushless DC fans, and speed measurement.

Features

- 3.5V~20V operating voltage
- Built-in temperature compensation circuit
- Open collector output
- 25mA(MAX) output current
- Package: TO-92S

Applications

- Brushless DC motor
- Brushless DC fan
- Speed measurement



Figure 1. Package Type

Pin Description

Package: TO-92S

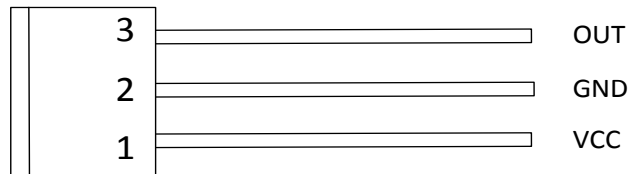


Figure 2. Pin Configuration

Pin Number	Pin Name	Function
1	VCC	Power supply pin
2	GND	GND pin
3	OUT	Output pin

Table 1. Pin Description

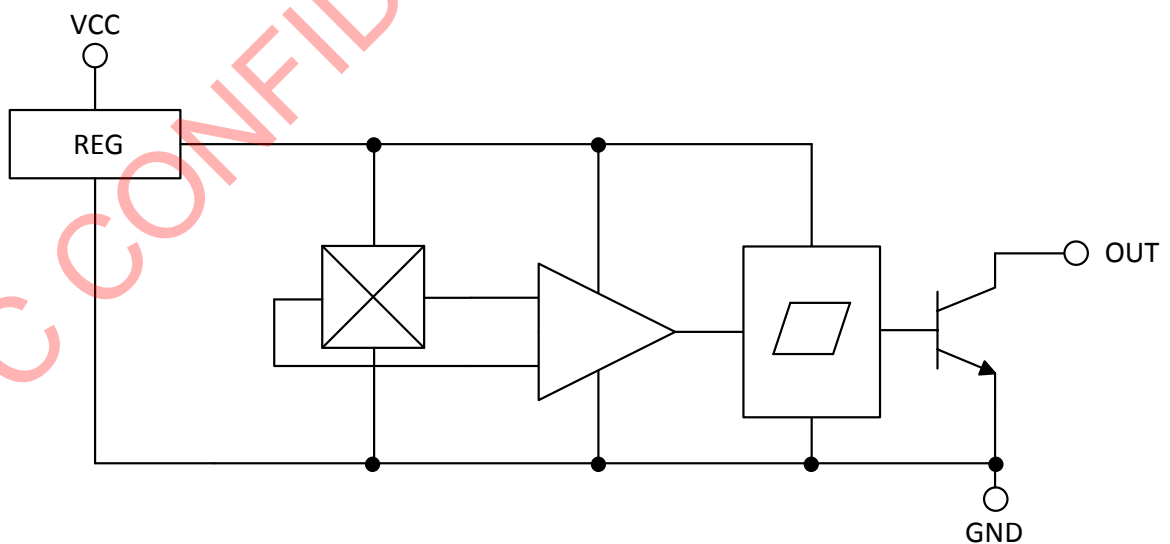
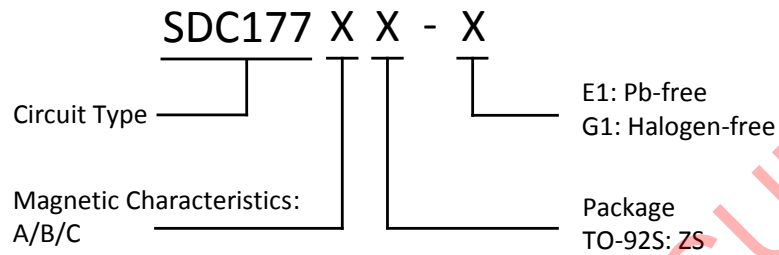
Functional Block Diagram


Figure 3. Functional Block Diagram

Ordering Information


Package	Temperature Range	Part Number		Marking ID		Packing Type
		Pb-free	Halogen-free	Pb-free	Halogen-free	
TO-92S	-20°C~85°C	SDC177AZS-E1	SDC177AZS-G1	177	177G	Bulk
		SDC177BZS-E1	SDC177BZS-G1	177	177G	Bulk
		SDC177CZS-E1	SDC177CZS-G1	177	177G	Bulk

Absolute Maximum Ratings (Note: Stresses greater than those listed under absolute maximum ratings may cause permanent damage to the device.)

Parameter	Symbol	Value	Units
Supply Voltage	V_{CC}	24	V
Output Voltage	V_{OUT}	24	V
Magnetic flux density	B	unlimited	GS
Output breakdown voltage	V_{CE}	30	V
Output current	I_{OUT}	25	mA
Maximum Junction Temperature	T_J	150	°C
ESD, HBM model per Mil-Std-883, Method 3015	HBM	2000	V
ESD, MM model per JEDEC EIA/JESD22-A115	MM	200	V
Latch-up test per JEDEC 78	-	200	mA
Package power dissipation	P_D	550	mW
Storage temperature range	T_S	-65~150	°C

Table 2. Absolute Maximum Ratings

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Power supply	V_{CC}	3.5	20	V
Operation temperature	T_a	-20	85	°C

Table 3. Recommended Operating Conditions

Electrical Characteristics ($T_a=25^{\circ}\text{C}$, $V_{CC}=12\text{V}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply voltage	V_{CC}	-	3.5	-	20	V
Output saturation voltage	V_{OUT}	$I_{OUT}=20\text{mA}$, $B > B_{OP}$	-	300	700	mV
Output leakage current	I_{OFF}	$V_{CE}=30\text{V}$, $B < B_{RP}$	-	0.1	10	μA
Supply current	I_{CC}	$V_{CC}=20\text{V}$	-	3.5	5.5	mA
Output rise time	t_r	$R_L=820\Omega$, $C_L=20\text{pF}$	-	0.3	1.50	μs
Output fall time	t_f	$R_L=820\Omega$, $C_L=20\text{pF}$	-	0.3	1.50	μs

Table 4. Electrical Characteristics

Magnetic Characteristics ($V_{CC}=12\text{V}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operate point	B_{OP}	$0^{\circ}\text{C} < T_a < 85^{\circ}\text{C}$	-	-	130	GS
		$T_a=25^{\circ}\text{C}$	-	-	120	GS
Release point	B_{RP}	$0^{\circ}\text{C} < T_a < 85^{\circ}\text{C}$	-130	-	-	GS
		$T_a=25^{\circ}\text{C}$	-120	-	-	GS
Hysteresis	B_H	$0^{\circ}\text{C} < T_a < 85^{\circ}\text{C}$	50	-	110	GS
		$T_a=25^{\circ}\text{C}$	50	-	100	GS

Table 5. Magnetic Characteristics

Note: when the south polar magnetic field is close to the IC marking surface, B is “+”.

Grade A

Parameter	Symbol	Min	Max	Unit
Operate point	B_{OP}	10	60	GS
Release point	B_{RP}	-60	-10	GS

Grade B

Parameter	Symbol	Min	Max	Unit
Operate point	B_{OP}	-	120	GS
Release point	B_{RP}	10	-	GS

Grade C

Parameter	Symbol	Min	Max	Unit
Operate point	B_{OP}	-	120	GS
Release point	B_{RP}	-120	-	GS

Typical Application

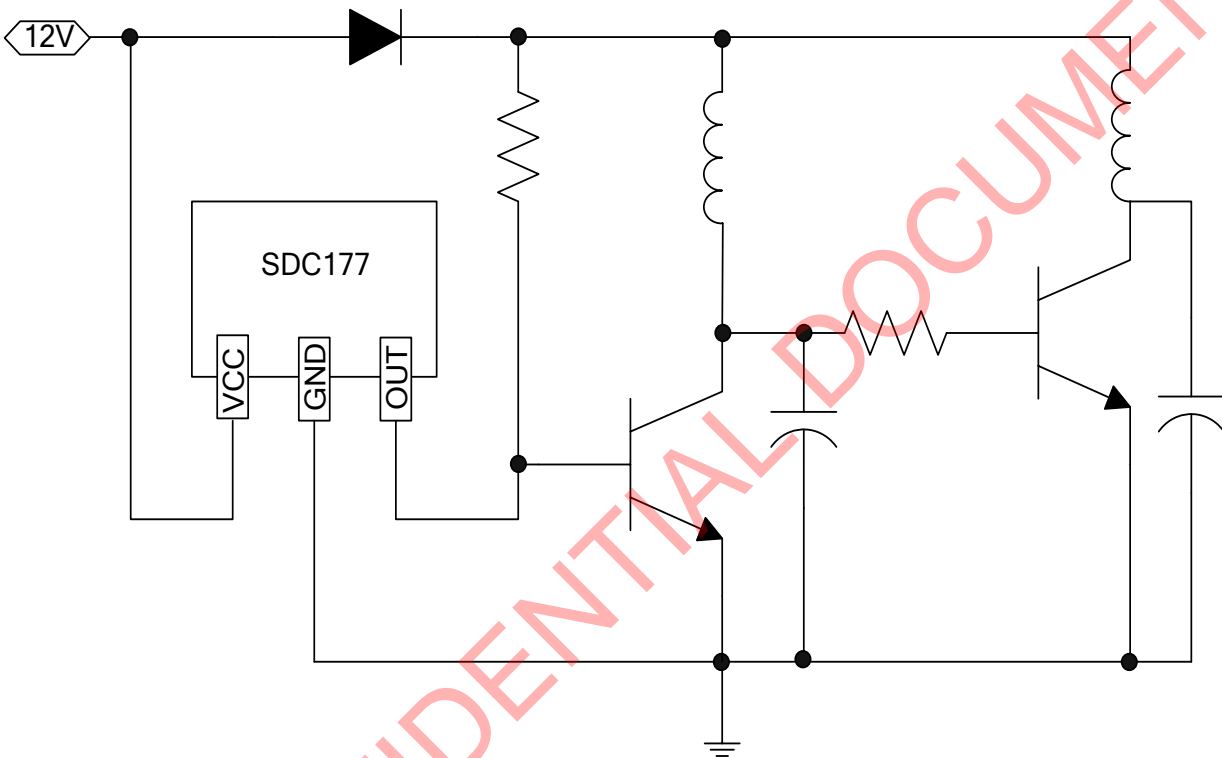
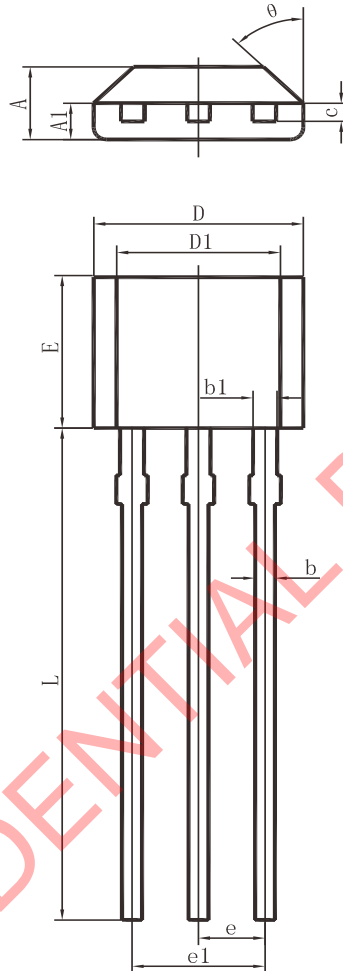


Figure 4. Typical Application

**Package Dimensions
TO-92S**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.350	0.480	0.014	0.019
b1	0.380	0.530	0.015	0.021
c	0.360	0.510	0.014	0.020
D	3.900	4.100	0.154	0.161
D1	2.970	3.270	0.117	0.129
E	2.900	3.100	0.116	0.124
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	14.500	14.900	0.580	0.596
θ	45° TYP.		45° TYP.	



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