

### General Description

The SDC283 is a one-chip solution for driving two-coil brushless DC cooling fans. Based on the advanced CMOS process, the IC contains a Hall-effect sensor, dynamic offset correction and low side output drivers.

In the case of power supply reverse connecting, the internal protection diode can protect IC but not protect coil, a protection diode can be added if necessary

### Features

- Wide operating voltage range: 3.5V~16V
- 150mA(AVG) output sink current
- Building-in protection diode
- Output thermal shutdown protection
- Package: TO-94

### Applications

- Brushless DC motor
- Brushless DC fan
- Revolution counting
- Speed measurement

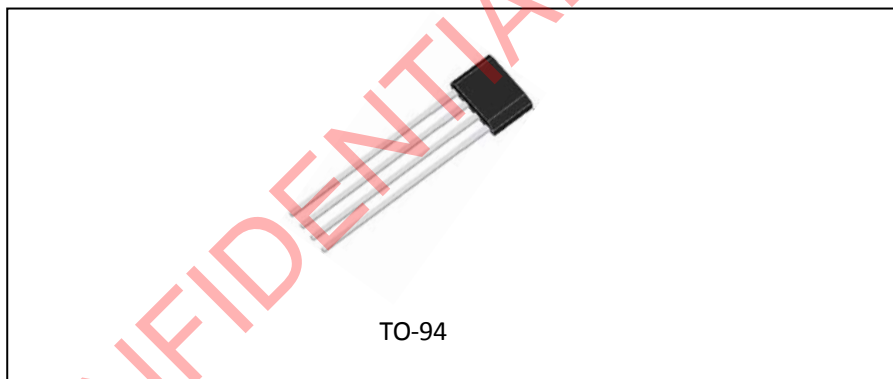


Figure 1. Package Type

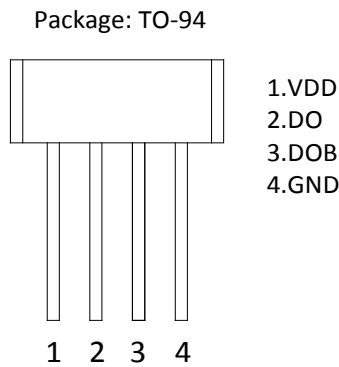
**Pin Configuration**


Figure2. Pin Configuration

Pin Number	Pin Name	Function
1	VDD	Supply voltage pin
2	DO	Output pin
3	DOB	Output pin
4	GND	Ground pin

Table 1. Pin Description

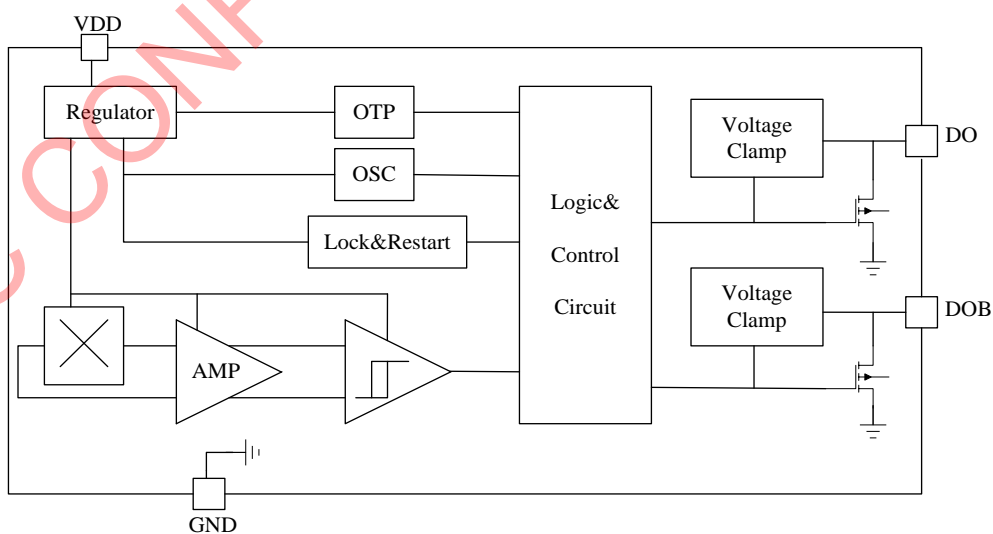
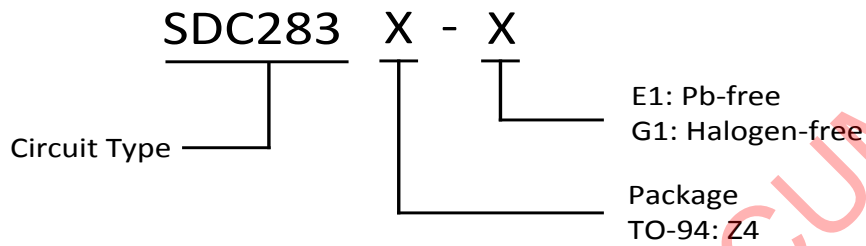
**Functional Block Diagram**


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-94	-20°C~85°C	SDC283Z4-E1	SDC283Z4-G1	277A	277AG	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	$V_{DD}$	20	V
Magnetic flux density	B	unlimited	GS
Output current	Continuous	180	mA
	Peak	300	
Storage temperature range	$T_S$	-65~150	°C
Package power dissipation	$P_D$	550	mW
ESD, HBM model per Mil-Std-883, Method 3015	HBM	4000	V
ESD, MM model per JEDEC EIA/JESD22-A115	MM	300	V
Latch-up test per JEDEC 78	-	200	mA
Maximum junction temperature	$T_J$	170	°C

Table 2. Absolute Maximum Ratings

**Recommended Operating Conditions**

Parameter	Symbol	Min	Max	Unit
Power supply	$V_{DD}$	3.5	16	V
Operation temperature	$T_a$	-20	85	°C
Operation Current (continuous)	$I_{OUT}$	-	150	mA

Table 3. Recommended Operating Conditions

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply voltage	$V_{DD}$	-	3.5	-	16	V
Output zener breakdown	$V_Z$	-	-	33	-	V
Output saturation voltage	$V_{SAT}$	$I_O=100\text{mA}$	-	0.4	-	V
Output leakage current	$I_{CEX}$	-	-	0.1	10	uA
Supply current	$I_{CC}$	$V_{DD}=20\text{V}$ , output open	-	2	-	mA
Output rise time	$t_r$	$R_L=820\Omega$ , $C_L=20\text{pF}$	-	0.05	0.1	us
Output falling time	$t_f$	$R_L=820\Omega$ , $C_L=20\text{pF}$	-	0.05	0.1	us
Switch time differential	$\Delta t$	$R_L=820\Omega$ , $C_L=20\text{pF}$	-	0.1	0.2	us
Over temperature shutdown threshold	$T_a$	-	-	165	-	°C
Over temperature shutdown hysteresis	Thys	-	-	30	-	°C

Table 4. Electrical Characteristics

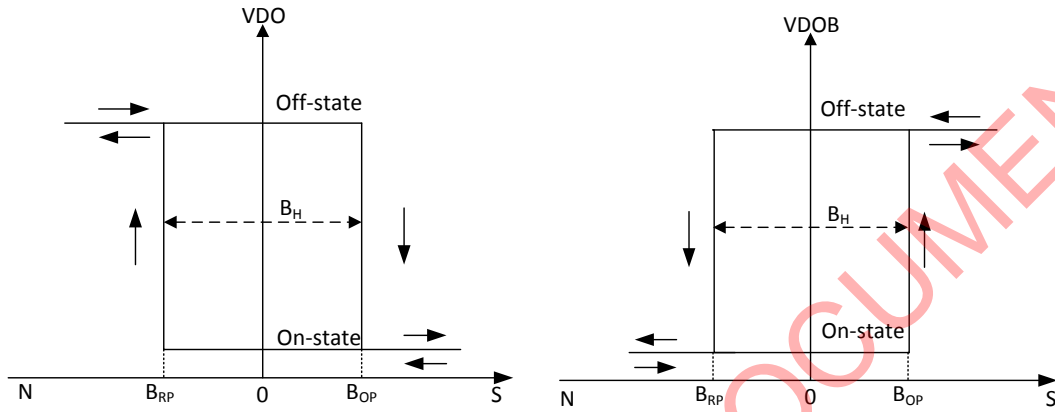
**Magnetic Characteristics** (Ta=25°C, V<sub>DD</sub>=12V, unless otherwise specified)


Figure 4. Magnetic Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Magnetic operate point	Bop	10	20	40	Gauss
Magnetic release point	Brp	-40	-20	-10	Gauss
Magnetic hysteresis	Bhys	30	40	50	Gauss

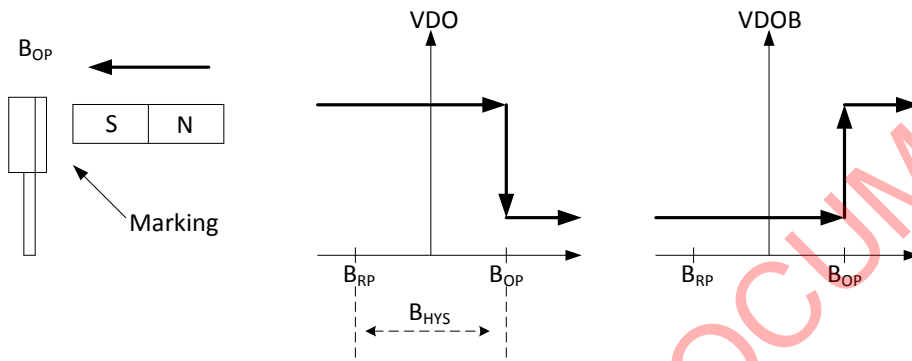
**Typical Performance Characteristics**


Figure 5. Magnetic Characteristics

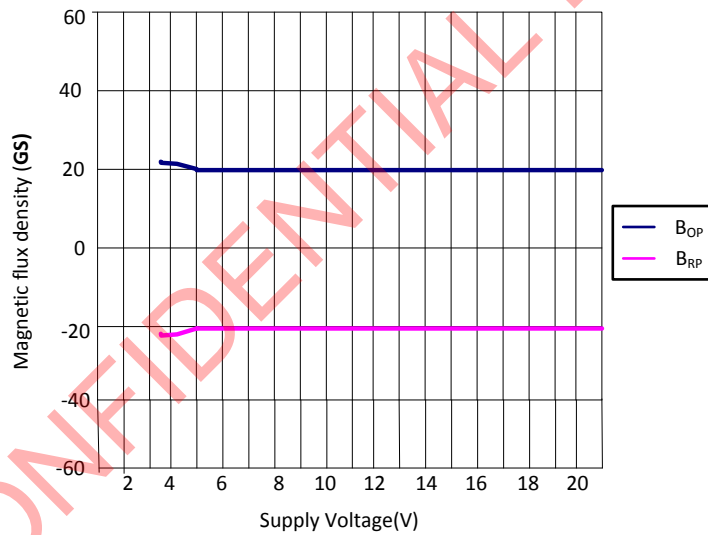


Figure 6. Typical Magnetic Switch Point vs. Supply Voltage

Typical Application

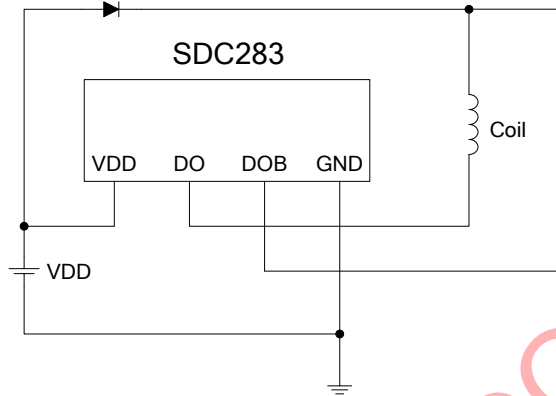
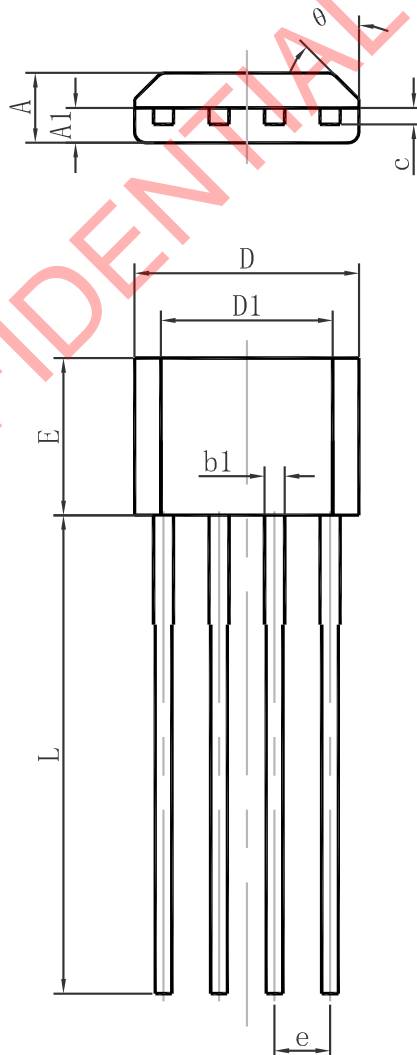


Figure 7. Typical Application

Package Dimension  
TO-94



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.800	0.055	0.071
A1	0.700	0.900	0.028	0.035
b1	0.380	0.550	0.015	0.022
C	0.360	0.510	0.014	0.020
D	5.050	5.350	0.202	0.214
D1	4.550	4.850	0.128	0.194
E	3.450	3.750	0.136	0.148
e	1.270 TYP.		0.050 TYP.	
L	14.300	14.700	0.572	0.588
$\theta$	10°TYP.		10°TYP.	

SDC CONFIDENTIAL DOCUMENT





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