Two-Phase DC Fan Driver **SDC283**

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

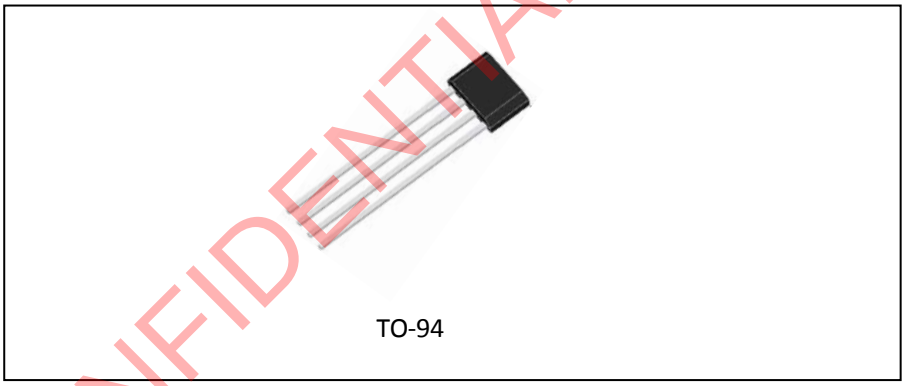


Figure 1. Package Type

Pin Configuration

Package: TO-94

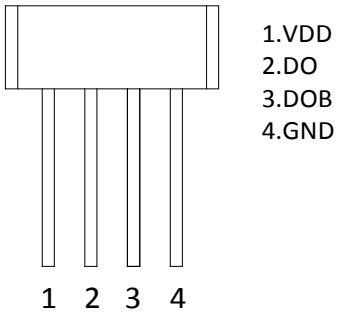


Figure2. Pin Configuration

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

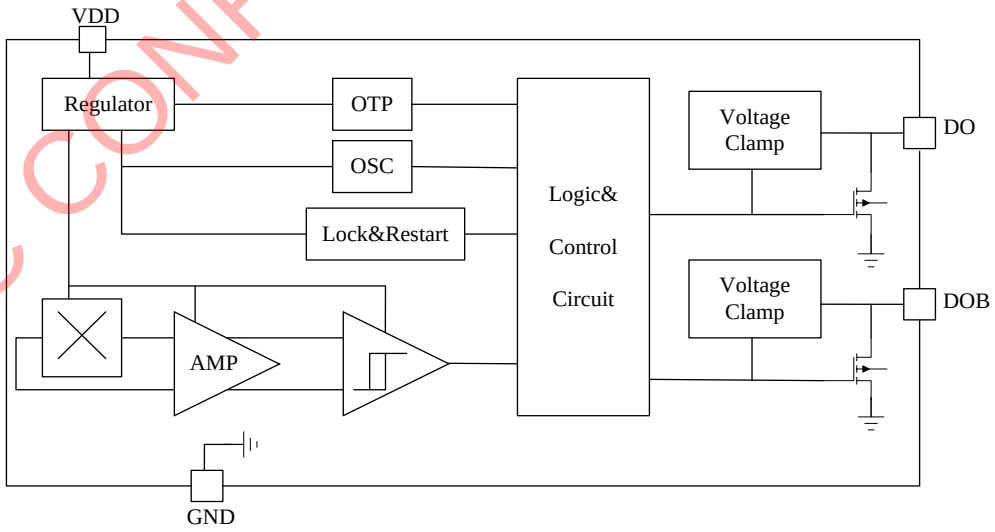
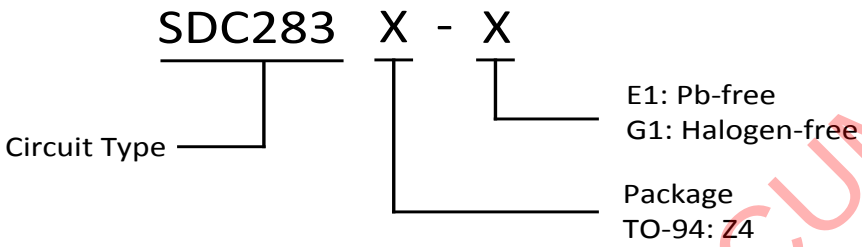


Figure 3. Functional Block Diagram

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	I_{OUT}	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	Ta	-20	85	°C
Operation Current (continuous)	I_{OUT}	-	150	mA

Table 3. Recommended Operating Conditions

Electrical Characteristics (Ta=25°C, V_{DD}=12V, 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=100mA	-	0.4	-	V
Output leakage current	I_{CEX}	-	-	0.1	10	uA
Supply current	I_{CC}	V_{DD} =20V, output open	-	2	-	mA
Output rise time	t_r	R_L=820Ω, C_L=20pF	-	0.05	0.1	us
Output falling time	t_f	R_L=820Ω, C_L=20pF	-	0.05	0.1	us
Switch time differential	Δt	R_L=820Ω, C_L=20pF	-	0.1	0.2	us
Over temperature shutdown threshold	Ta	-	-	165	-	°C
Over temperature shutdown hysteresis	Thys	-	-	30	-	°C

Table 4. Electrical Characteristics

Magnetic Characteristics (Ta=25°C, V_{DD}=12V, unless otherwise specified)

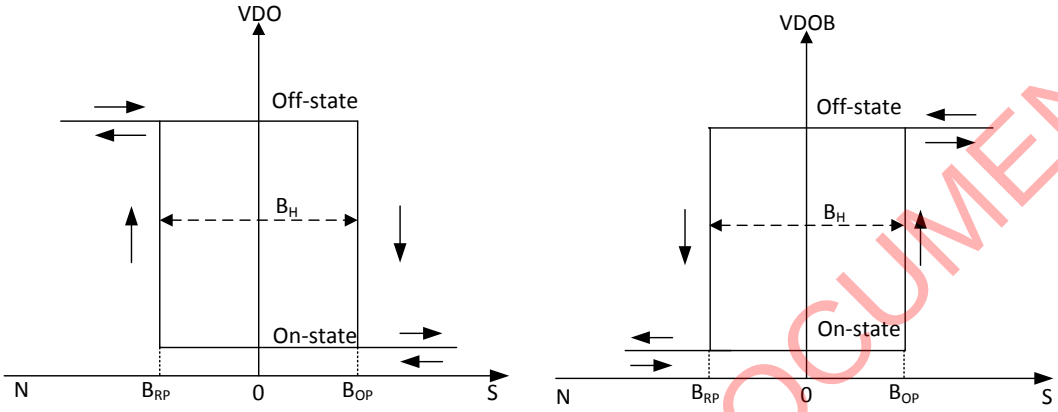


Figure 4. Magnetic Characteristics

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

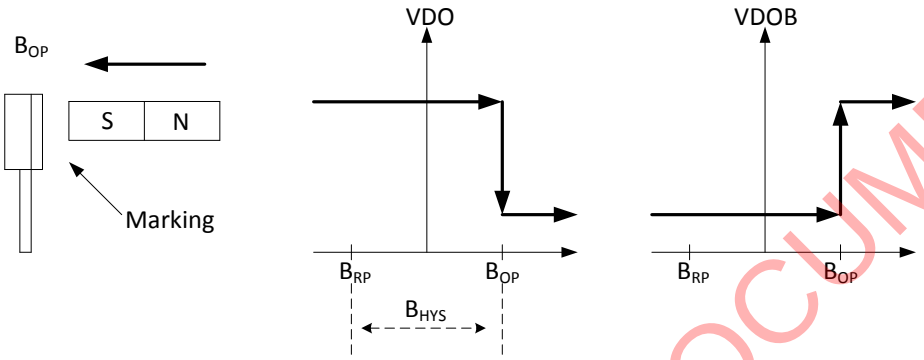


Figure 5. Magnetic Characteristics

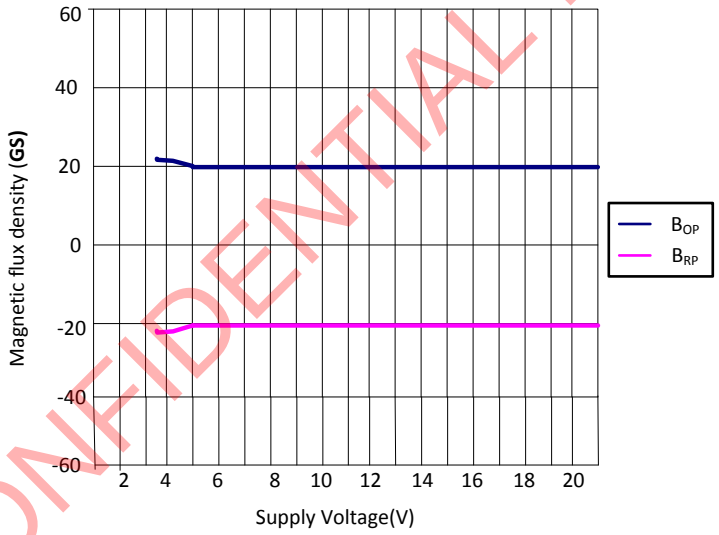


Figure 6. Typical Magnetic Switch Point vs. Supply Voltage

Typical Application

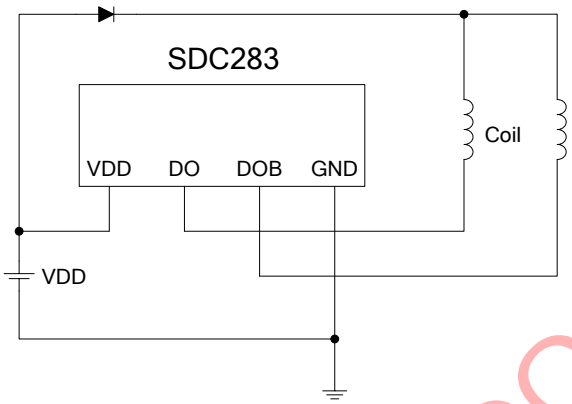
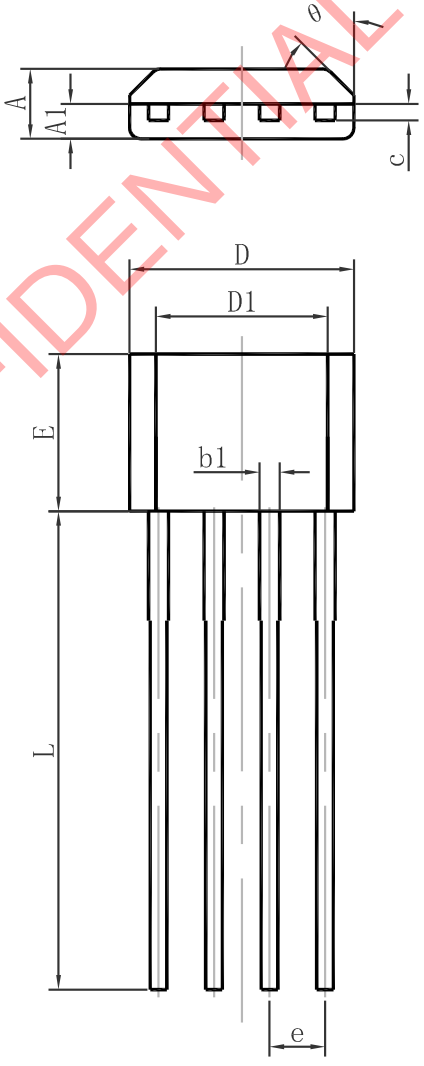


Figure 7. Typical Application

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
θ	10°TYP.		10°TYP.	

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