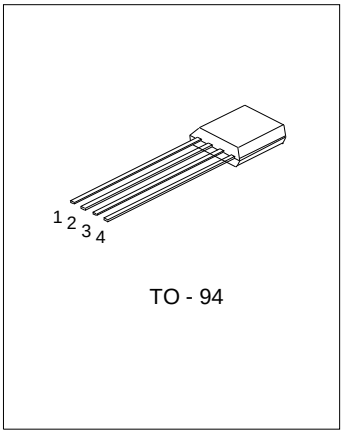
BRUSH-LESS DC-FAN DRIVER WITH ON-CHIP HALL SENSOR

DESCRIPTION

SA276 mainly designed for electronic commutation of brush-less DC fan. This IC internally includes the Hall Plate, Regulator, Pre-Amplifier, Comparator, and a pair of complementary open-collector Outputs (DO, DOB).

SA276 internally includes power-reverse protecting diode, the protecting diode only protects chips but not for coils. If necessary, add one external diode to block the reverse current from coils.



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FEATURES

* On-chip hall sensor
* Wide operating voltage: 3.5V to 20V
* 400mA (avg) output sink current
* Build-in power-reverse protecting diode only for reverse power connecting

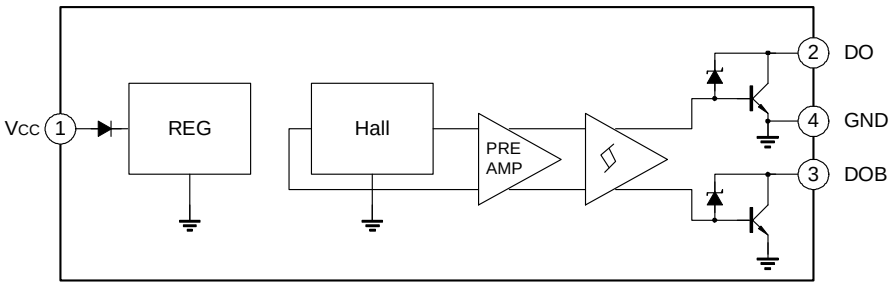
ORDERING INFORMATION

Device	Package
SA276	TO-94

APPLICATIONS

* Dual coils brush-less DC fan
* Dual coils brush-less DC motor
* Revolution counting
* Speed measurement

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Tamb=25°C)

Characteristics	Symbol	Value	Unit
Supply Voltage	Vcc	25	V
Reverse Vcc Polarity Voltage	Vrcc	-25	V
Magnetic Flux Density	B	Unlimited	G

(To be continued)

(Continued)

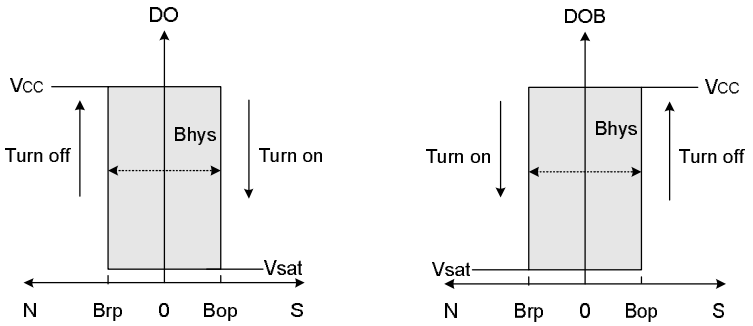
Characteristics		Symbol	Value	Unit
Output On Current	Continuous	I_{omax}	400	mA
	Hold		500	mA
	Peak (start up)		700	mA
Maximum Junction Temp		T_j	170	°C
Storage Temperature Range		T_{stg}	-55~+150	°C
Operating Temperature Range		T_{amb}	-25~+85	°C
Package Power Dissipation(T_{amb}≤85°C)		P_{tot}	500	mW
Maximum Jointing Temp t≤10s		T_{sd}	260	°C

ELECTRICAL CHARACTERISTICS (T_{amb}=25°C, V_{CC}=4.0V to 20V)

Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}		3.5		25	V
Supply Current	I_{CC}	V_{CC}=20V, R_L=∞		16	25	mA
Low Supply Voltage	V_{ce}	V_{CC}=3.5V, I_L=100mA		0.4		V
Output Saturation Voltage	$V_{ce(sat)}$	V_{CC}=12V, I_L=300mA		0.3	0.5	V
Output Leakage Current	I_{cex}	V_{CE}=12V, V_{CC}=12V		<0.1	10	μA
Output Rise Time	tr	V_{CC}=12V, R_L=820Ω,C_L=20pF		3.0	10	μs
Output Falling Time	tf	V_{CC}=12V, R_L=820Ω,C_L=20pF		0.4	2	μs
Switch Time Differential	Δt	V_{CC}=14V, R_L=820Ω,C_L=20pF		3.0	10	μs
Output Zener Breakdown	V_z			40		V

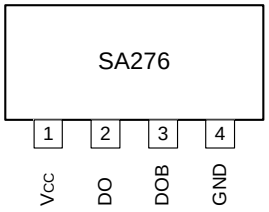
MAGNETIC CHARACTERISTICS

Characteristics	Symbol	Test circuit	Min.	Typ.	Max.	Unit
Operate Point	B_{op}	T_{amb}=25°C	0	--	70	G
		T_{amb}=-25~+85°C	0	--	70	G
Release Point	B_{rp}	T_{amb}=25°C	0	--	-70	G
		T_{amb}=-25~+85°C	0	--	-70	G
Hysteresis	B_{hys}	T_{amb}=25°C	20	--	140	G
		T_{amb}=-25~+85°C	10	--	140	G



While the magnetic flux density B is larger than operate point Bop, DO will turn on and output low potential, DOB will turn off and output high potential. Each output is latched until the magnetic flux density B is lower than release point Brp, and then DO; DOB transfer each state.

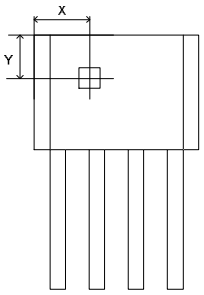
PIN CONFIGURATION



PIN DESCRIPTION

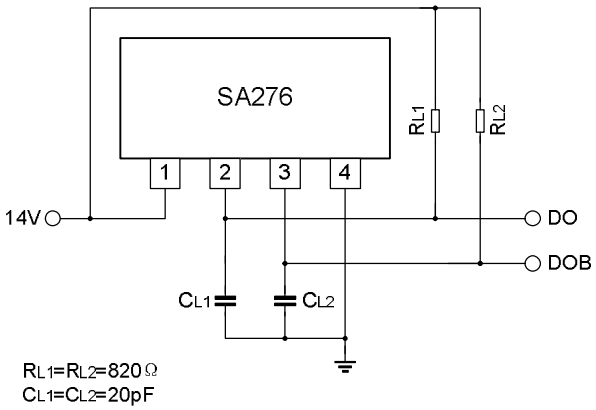
Pin No.	Symbol	Description
1	VCC	Power supply
2	DO	Positive output
3	DOB	Negative output
4	GND	Ground.

HALL SENSOR LOCATION

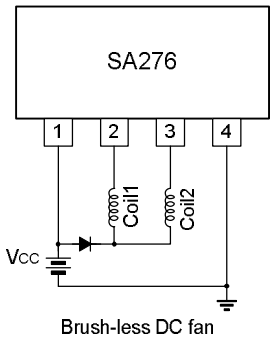


		Unit
X	1.75	mm
Y	1.35	mm

TEST CIRCUIT

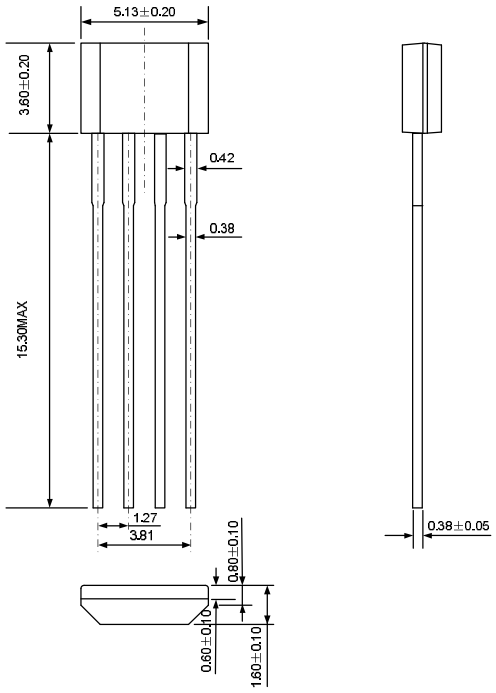


TYPICAL APPLICATION CIRCUIT



PACKAGE OUTLINE

TO-94 UNIT: mm



ATTACH

Revision History

Data	REV	Description	Page
2004.06.28	1.0	Original	
2004.07.15	1.1	Modify the “PACKAGE OUTLINE” .	5