

## Complementary Output Hall Effect Fan Driver

### Features

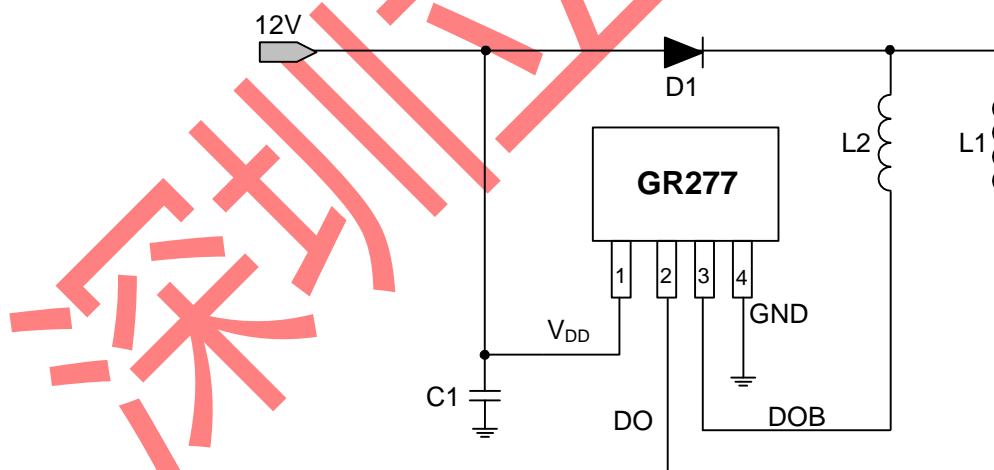
- On-chip Hall effect sensor with two different sensitivity and hysteresis settings
- Built-in protecting diode only for chip reverse power connecting
- -40°C to 85°C operating temperature
- Low Profile SIP-4L Package( Green and PB Free )

### Description

GR277 are integrated Hall sensors with output drivers, mainly designed for electronic commutation of brush-less DC Fan. This IC is using HV BCD process internally includes the regulator, protecting diode, Hall plate, amplifier, comparator, and a pair of complementary open-Drain outputs (DO, DOB).

While the magnetic flux density (B) is larger than operate point (Bop), DO will turn on (low), and meanwhile DOB will turn off (high). Each output is latched until B is lower than release point (Brp), and then DO, DOB transfer each state. For DC fan application, sometimes need to test power reverse connection condition. Internal diode only protects chip-side but not for coil-side. If necessary, add one external diode to block the reverse current from coil-side

### Application Circuit

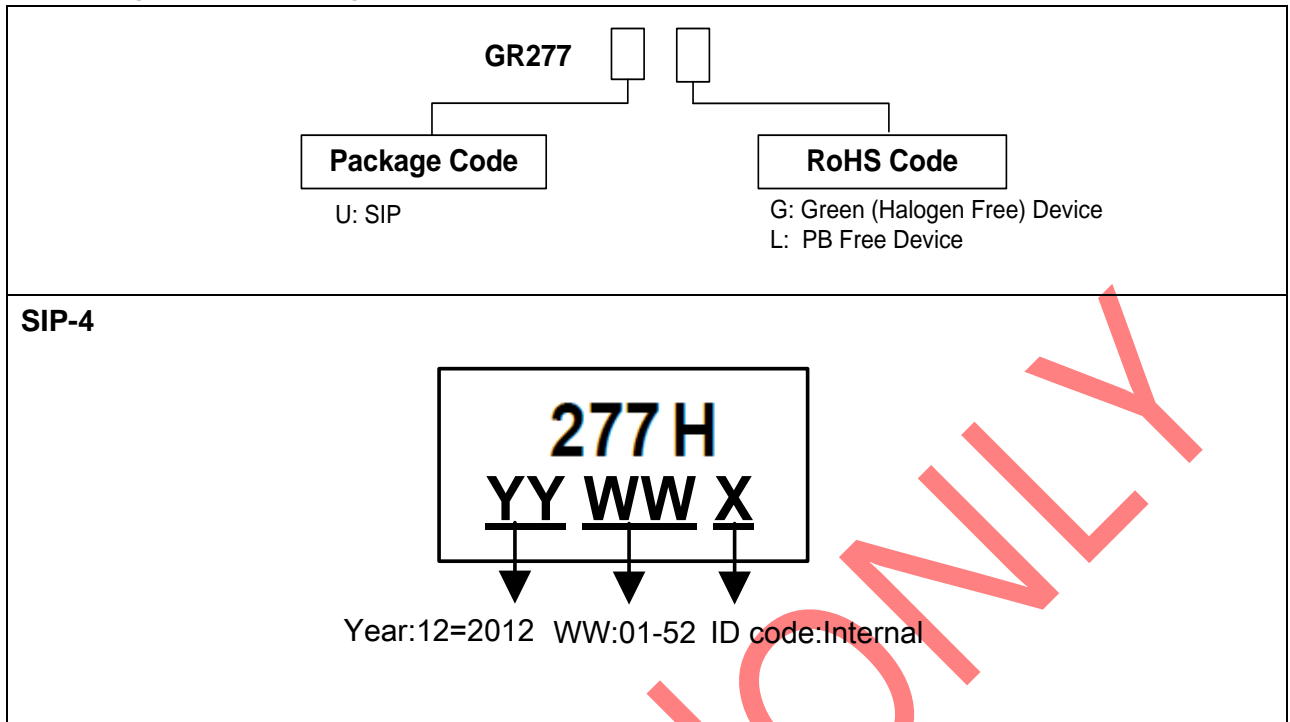


12V brush-less DC fan

Note1: C1 (Optional) is for power stabilization, Recommended E-Cap 1uF/50V

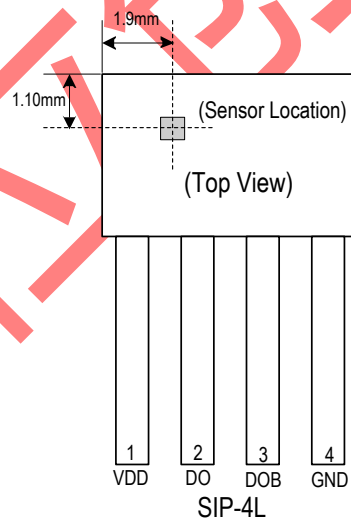
Note2: D1 (Optional) is a reverse protect diode.

## Ordering and Marking Information



Greenergy OPTO Inc. reserves the right to make changes to improve reliability or manufacture ability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

## Pin Configuration



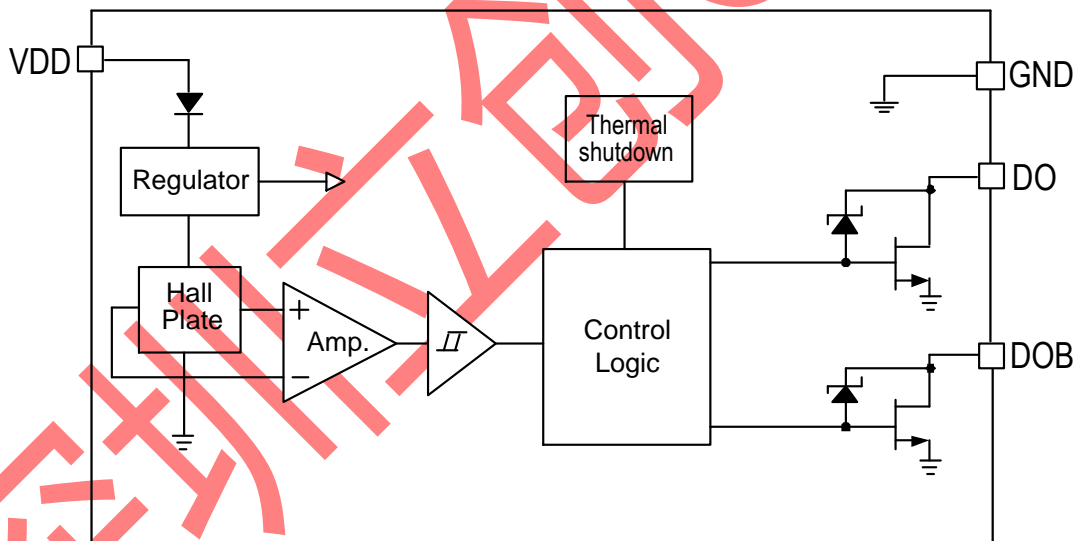
## Pin Description

Pin No.	Name	Function
1	VDD	Power Supply Pin
2	DO	Output1
3	DOB	Output2
4	GND	Ground Pin

### Absolute Maximum Ratings

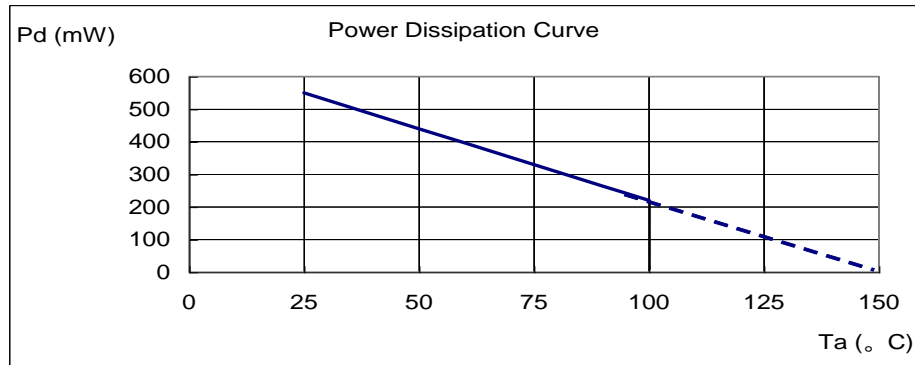
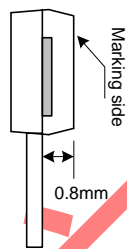
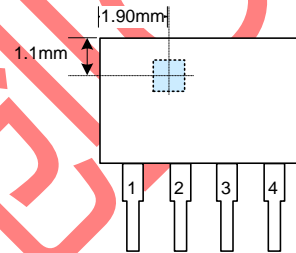
Supply Voltage VCC, VCC .....	20V
Reverse VCC Polarity Voltage, VRCC .....	-20V
Magnetic Flux Density, B .....	Unlimited Gauss
Output Current(Continuous), IO .....	400mA
Output Current(Hold ), IO .....	500mA
Output Current(Peak (start up)), IO .....	700mA
Power Dissipation, PD .....	550mW
Storage Temperature Range, TSTG .....	-65°C ~ 150 °C
Thermal Resistance from Junction to case, $\theta_{JC}$ .....	49°C/W
Thermal Resistance from Junction to ambient, $\theta_{JA}$ .....	227°C/W
Ambient Temperature, TA .....	-40°C~85°C

### Function Block



**Performance Characteristics**

<b>T<sub>A</sub> (°C)</b>	<b>25</b>	<b>50</b>	<b>60</b>	<b>70</b>	<b>80</b>	<b>85</b>	<b>90</b>	<b>95</b>	<b>100</b>
<b>Pd (mW)</b>	550	440	396	352	308	286	264	242	220
<b>T<sub>A</sub> (°C)</b>	<b>105</b>	<b>110</b>	<b>115</b>	<b>120</b>	<b>125</b>	<b>130</b>	<b>135</b>	<b>140</b>	<b>150</b>
<b>Pd (mW)</b>	198	176	154	132	110	88	66	44	0


**Active Area Depth**

**Package Sensor Location**


**Electrical Characteristics** (VCC = 12.0V & TA = +25°C, unless otherwise noted.)

Parameter	Min.	Typ.	Max.	Unit
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**SUPPLY VOLTAGE**

Supply Voltage, VDD(Operating)	3.3	-	18	V
Supply Current, IDD (Operating)	-	3.5	5	mA
Output Leakage Current, IOFF(VOUT =12V)	-	<0.1	10	uA
Output On resistance, RDS(ON) (IOUT =300mA)	-	1.5	1.65	Ω
Output Clamping Voltage, VZ(DO, DOB)	-	32	-	V
Thermal shutdown Temp, TSD	150	-	-	°C
Thermal Shutdown Hysteresis, TSH	-	30	-	°C
Magnetic	(1mT=10 Gauss)			
Operate Point, BOP	5	25	50	Gauss
Release Point, BRP	-50	-25	-5	Gauss
Hysteresis, BHYS	-	50	-	Gauss

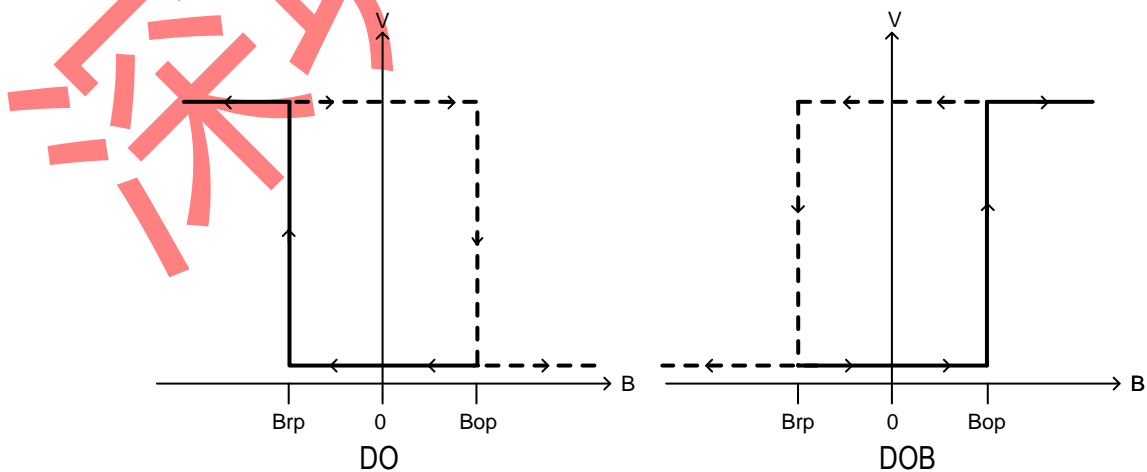
**Rise/Fall/Switch Time**

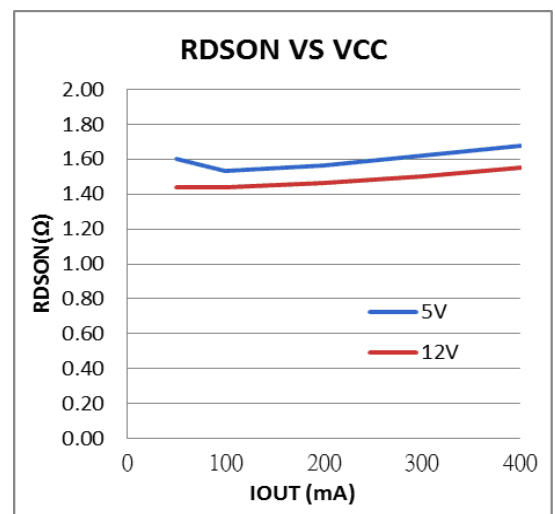
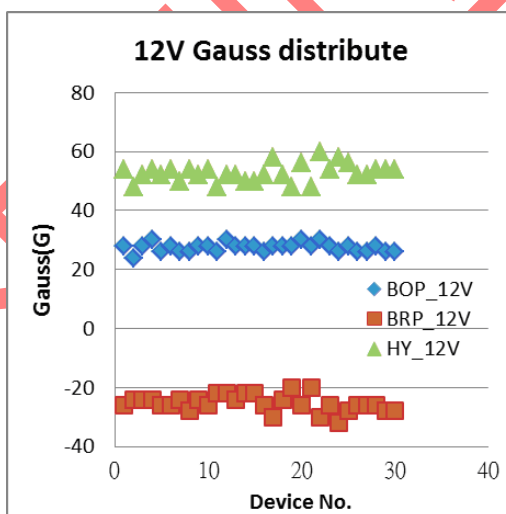
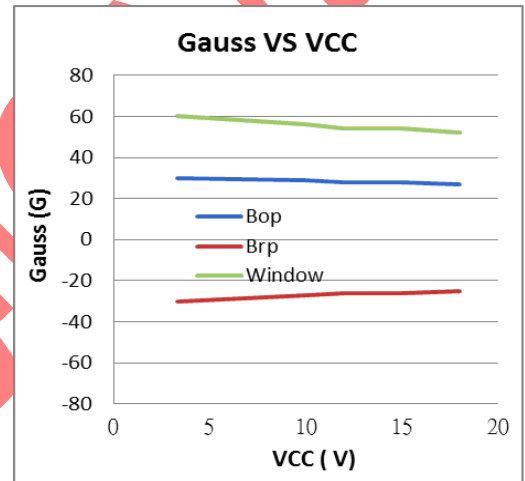
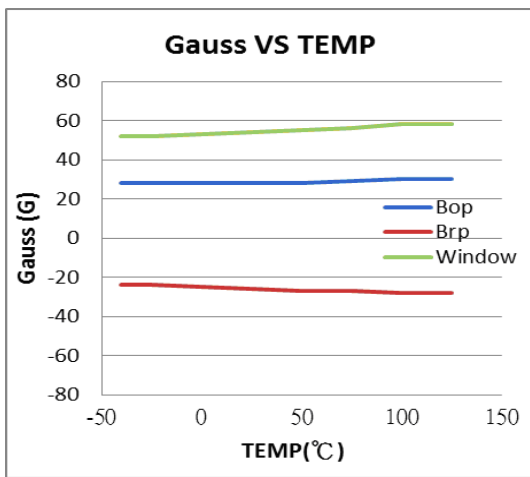
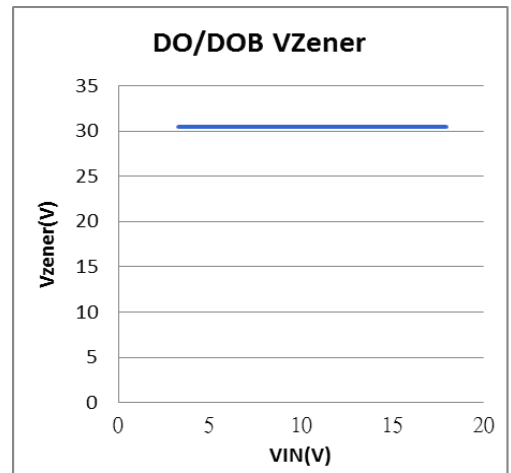
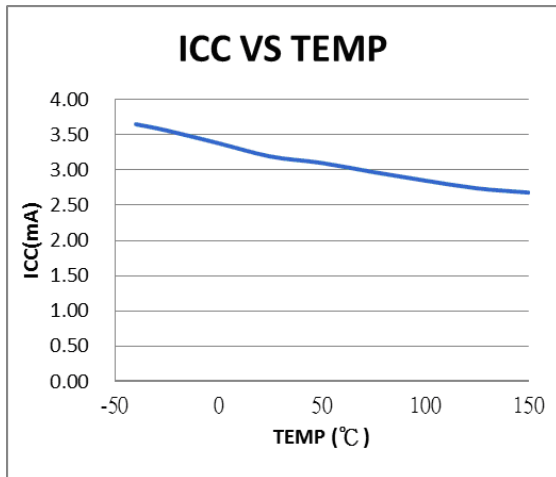
Output Rise time(Tr) (Vcc=14v,R <sub>L</sub> =820Ω,C <sub>L</sub> =20pf)	-	1.8	2.0	us
Output Fall time(Tf) (Vcc=14v,R <sub>L</sub> =820Ω,C <sub>L</sub> =20pf)	-	0.5	0.6	us
Switch Time(Δt) (Vcc=14v,R <sub>L</sub> =820Ω,C <sub>L</sub> =20pf)	-	1.9	2.1	us

**Driver output vs. magnetic pole**

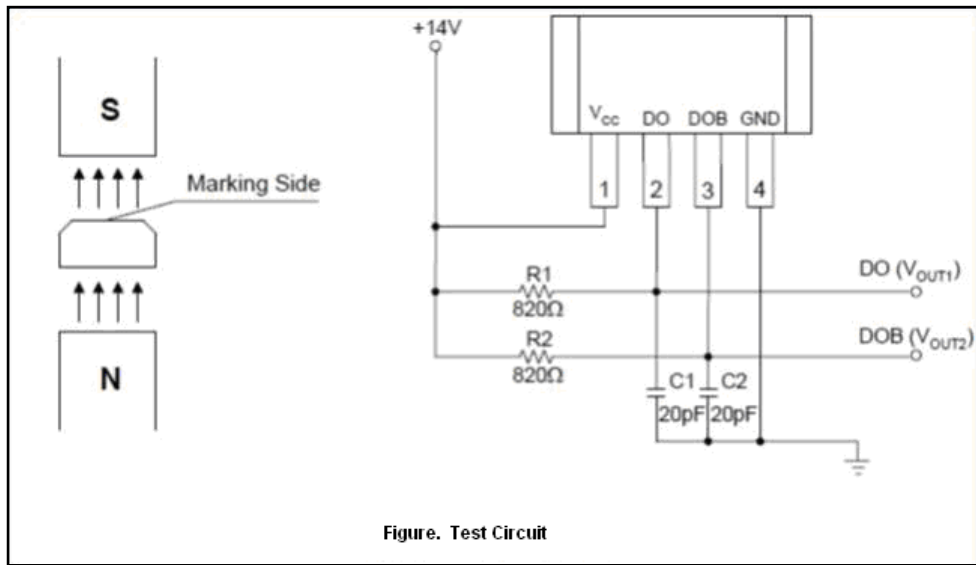
Characteristics	Test Conditions	DO	DOB
North pole	B < Brp	High	Low
South pole	B > Bop	Low	High

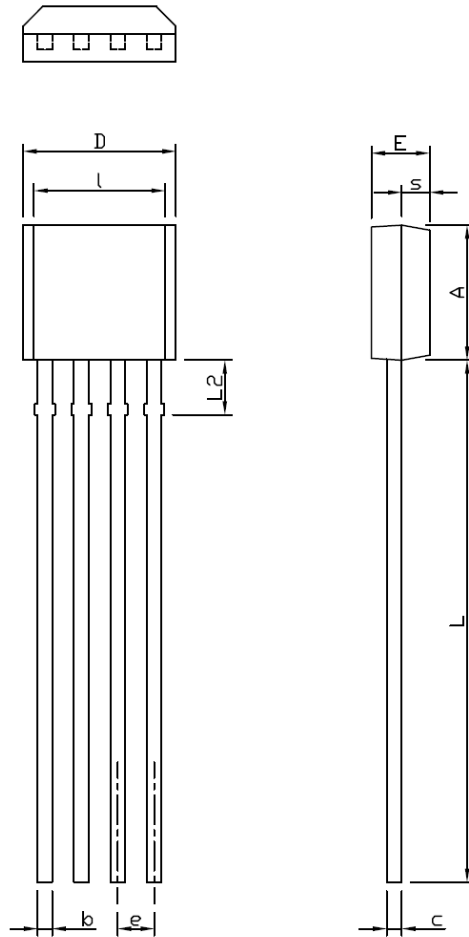
Note: The magnetic pole is applied facing the branded side of the package





Rise Time/Fall Time/Switch Time test circuit



**Package Information**
**SIP-4L**


	A	b	c	D	e	E	I	L	L2	s
Min	3.45	0.31	×	4.98	1.27	1.29	×	13	1.32	×
Max	3.79	0.56	×	5.36	BSC	1.81	×	16	1.65	×

(mm)

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