

Single Phase Hall Effect Fan Driver

Description

The SA477 is an integrated Hall sensor with H-Bridged output driver designed for brushless DC motor applications. The device includes an on-chip Hall sensor for magnetic sensing, an amplifier that amplifies the Hall voltage, a comparator to provide switching hysteresis for noise rejection, a bi-directional driver for sinking and driving large current load.

Placing the device in a variable magnetic field, if the magnetic flux density is larger than threshold BOP, the DO is turned to sink and DOB is turned to drive. This output state is held until the magnetic flux density reverses and falls below BRP, then causes DO to be turned to drive and DOB turned to sink.

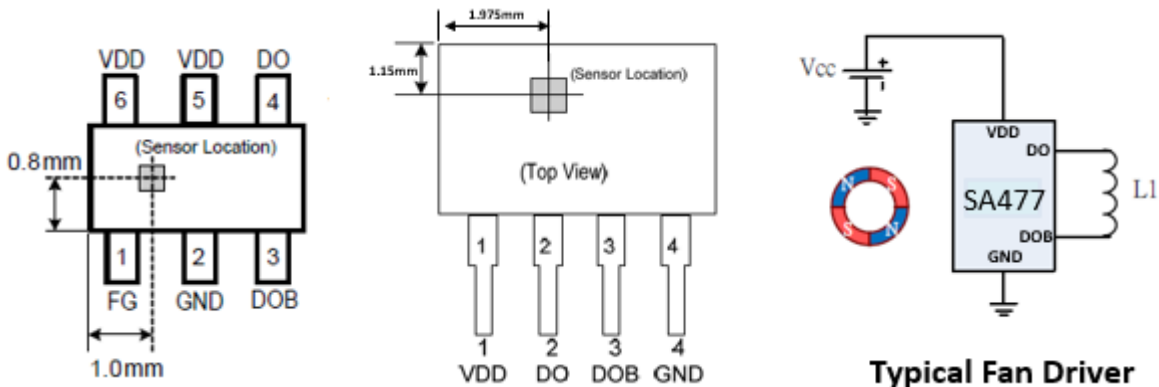
Features

- Operating Voltage: 2.3V to 20V
- Output Current: 350mA
- On-Chip High sensitivity Hall-effect Sensor
- H-Bridge Output Drivers for Single Coil
- Built-in Reverse Protection Diode
- Thermal Shutdown Protection
- Low Output Switching Current Noise
- -40°C to 125°C Operating Temperature
- SOT23-6 and SIP-4L Packages

Application

- Fan Driver

SA477 Package & Simplified Application

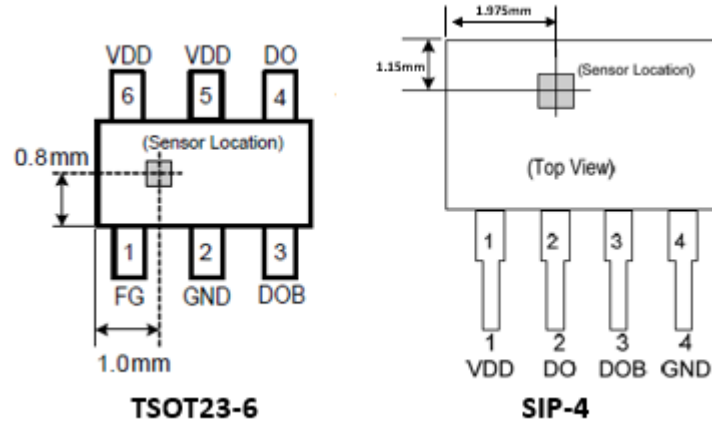


Device Information

Part No.	Package	Quantity	Operation Temp.
SA477	SOT23-6	3000	-40~125° C
SA477	SIP4	1000	-40~125° C

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Pin Descriptions



TSOT23-6

NO.	NAME	TYPE	DESCRIPTION
1	FG	O	Frequency Generator
2	GND	P	Ground
3	DOB	I	Output 2
4	DO	I	Output 1
5,6	VDD	P	Power Supply for H-Bridge, Connection 1uF or bigger capacitor between VDD and GND in high voltage application

SIP-4

NO.	NAME	TYPE	DESCRIPTION
1	VDD	P	Power Supply for H-Bridge, Connection 1uF or bigger capacitor between VDD and GND in high voltage application
2	DO	I	Output 1
3	DOB	I	Output 2
4	GND	P	Ground

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Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)

		MIN	MAX	UNIT
Power supply voltage	VDD	-0.3	20.0	V
Continuous phase node pin voltage	DO, DOB	-0.3	VDD	V
Magnetic Flux Density	B		Unlimited	Gauss
Output current (SIP4)	Continuous		350*	mA
	Hold		400	mA
	Peak (Start-Up)		800	mA
Operating junction temperature,	T _J	-40	150	°C
Storage temperature,	T _{stg}	-65	150	°C
Thermal Impedance (SIP4)	θ _{JA}		227	°C/W

Notes: * Using 25mm² FR4 Signal layer PCB (1 oz) under VM=12.0V test.

Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)

		MIN	MAX	UNIT
Power supply voltage	VDD	3.5	18.0	V
Operating temperature,	T _A	-40	125	°C
Output current	I _{OUT}	0	350**	mA

Notes: ** Using 25mm² FR4 Signal layer PCB (1 oz) under VM=12.0V test.

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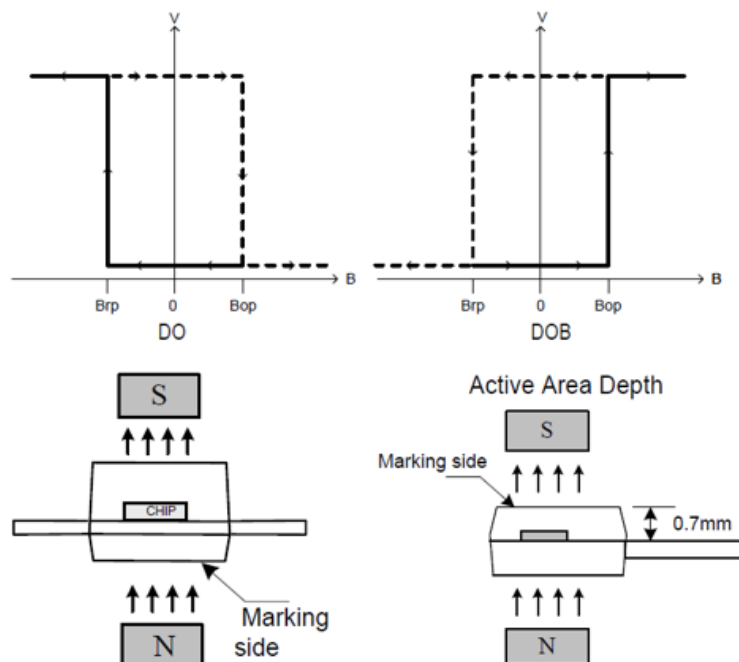
Electrical Characteristics

VM=12V, T_A = 25°C, over recommended operating conditions (unless otherwise noted)

PARAMETER	UNIT	TEST CONDITIONS	MIN	TYP	MAX	UNIT
VDD	VDD operating voltage		3.5		18.0	V
I _{VDD}	VDD operating supply current	VM=12V		3.0	5.0	mA
R _{DSON}	High-side & Low-side FET on resistance	VM=12V, LS+HS, I _{OUT} =250mA		2.3		Ω
FG	FG Output Low Voltage	5mA		0.3		V
B _{OP}	Operating Point			30		Gauss
B _{RP}	Releasing Point			-30		Gauss
T _{SD}	Thermal shutdown temperature			150		°C
T _{HYS}	Thermal shutdown hysteresis			40		

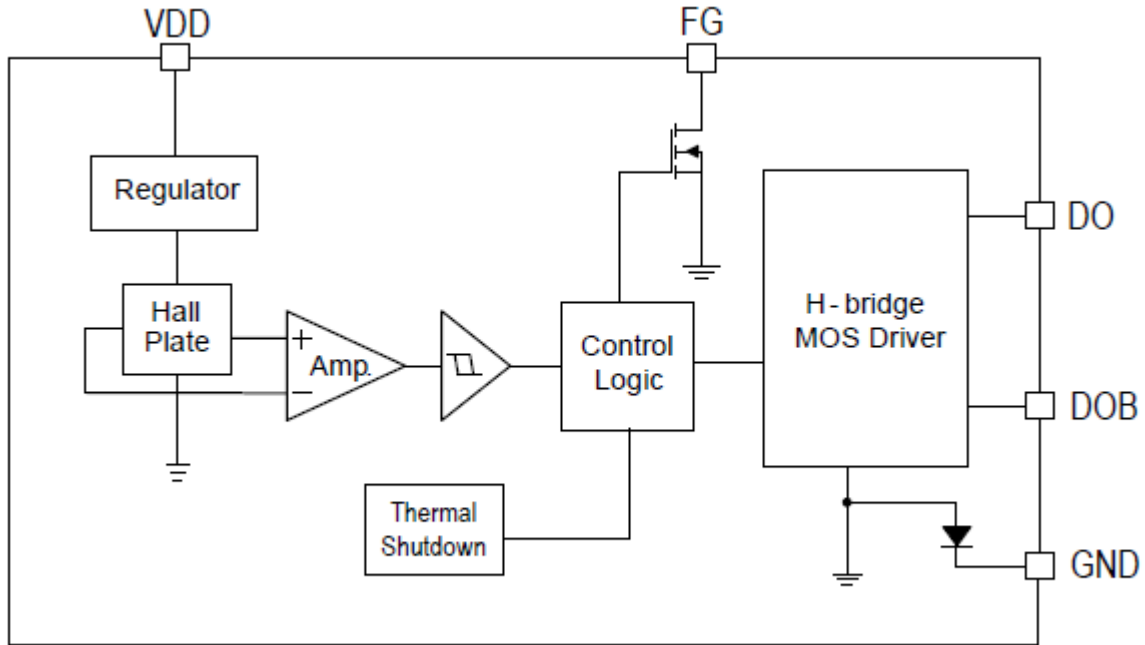
Driver output vs. magnetic pole

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



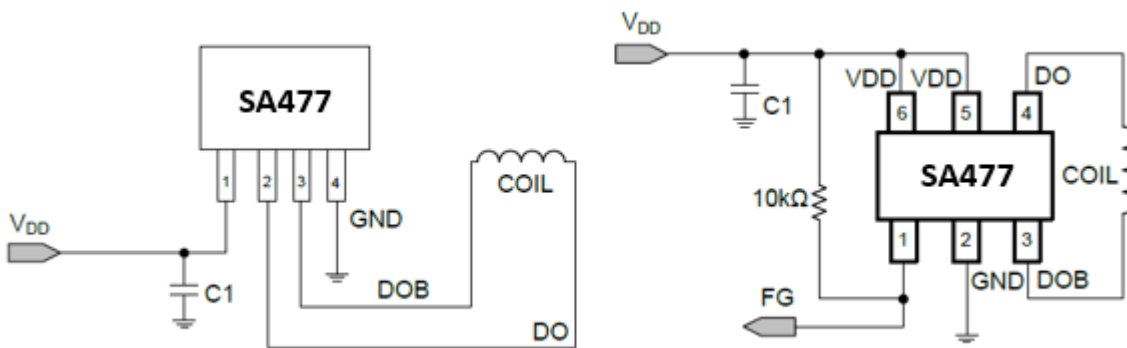
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Block Diagram



Application Notes:

1. Schematic Descriptions



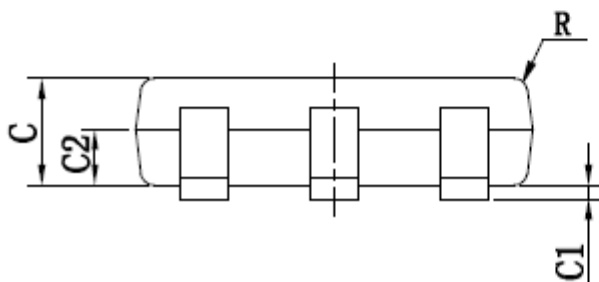
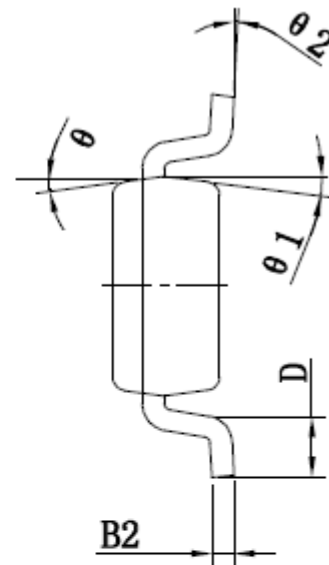
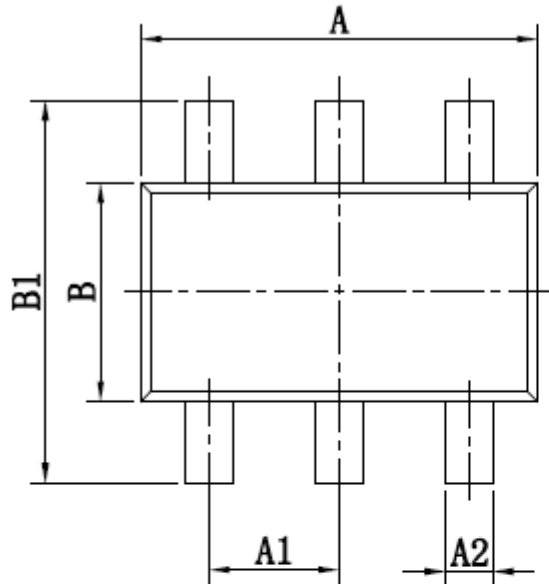
Notes : $C1 \geq 1\mu F$ (Option), Enhance the reliability during hot swap.

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Package

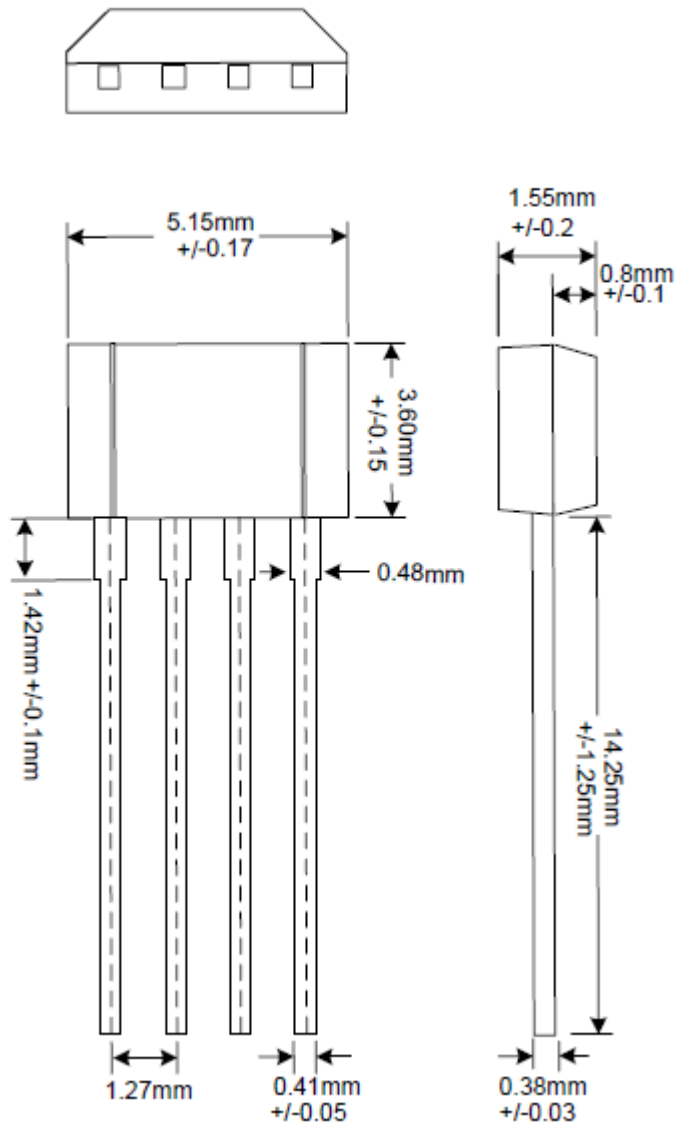
TSOT23-6

尺寸/ 标注/ SYMBOL	SIZE	最小/MIN(mm)	最大/MAX(mm)	尺寸/ 标注/ SYMBOL	SIZE	最小/MIN(mm)	最大/MAX(mm)
A		2.820	3.020	C1		0.000	0.100
A1		0.950 (BSC)		C2		0.378	0.438
A2		0.350	0.500	D		0.300	0.600
B		1.600	1.700	θ		9° TYP4	
B1		2.650	2.950	$\theta 1$		10° TYP4	
B2		0.080	0.200	$\theta 2$		0~8°	
C		0.700	0.800				



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SIP4



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