

ATS177

SINGLE OUTPUT HALL EFFECT LATCH

Features

- 3.5V to 20V DC operation voltage
- Temperature compensation
- Wide operating voltage range
- Open-Collector pre-driver
- 25mA maximum sinking output current
- Reverse polarity protection
- Lead Free Package: SIP-3L
- Lead Free Finish/ RoHS Compliant (Note 1)

General Description

ATS177 is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal bandgap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density larger than threshold Bop, DO is turned on (low). The output state is held until a magnetic flux density reversal falls below Brp causing DO to be turned off (high).

Applications

- Brush-less DC Motor
- Brush-less DC Fan
- **Revolution counting**
- Speed measurement

Ordering Information



				Βι	ılk	Amm	o Box		
	Device	Package Code	Packaging (Note 2)	Quantity	Part Number Suffix	Quantity	Part Number Suffix	Magnetic Characteristics	
(Pb)	ATS177-PL-A-A	Р	SIP-3L	NA	NA	4000/Box	-A	A	
Pb	ATS177-PL-A-B	Р	SIP-3L	NA	NA	4000/Box	-A	В	
Pb	ATS177-PL-B-A	Р	SIP-3L	1000	-B	NA	NA	А	
Pb	ATS177-PL-B-B	Р	SIP-3L	1000	-B	NA	NA	В	

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see EU Directive 2002/95/EC Annex Notes. 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
Bulk is for SIP-3L Straight Lead.
Ammo Box is for SIP-3L Spread Lead.



Pin Assignments



Pin Descriptions

Pin name	P/I/O	Pin #	Description
Vcc	Р	1	Positive power supply
GND	Р	2	Ground
DO	0	3	Digital output

Functional Block Diagrams





Typical Circuit



Brush-less DC Fan

Absolute Maximum Ratings (at TA = 25° C)

Symbol	Parameter	Rating	Unit		
V _{cc}	Supply Voltage	20	V		
V _{RCC}	Reverse V _{CC} Polarity Voltage	-20			
В	Magnetic Flux Density	Unlimited			
V _{CE}	Output OFF Voltage	30	V		
PD	Package Power Dissipation	550	mW		
I _C	Output "ON" Current	25	mA		
T _{J(MAX)}	Maximum Junction Temperature	150	°C		
T _{ST}	Storage Temperature Range		-65~+150	°C	

Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
V _{cc}	Supply Voltage	Operating	3.5	20	V
T _A	Operating Ambient Temperature (Note 5)	Operating	-20	85	°C

Notes: 5. Shall not exceed P_D and Safety Operation Area.



Electrical Characteristics (TA = + 25°C)

Symbol	Characteristic	Test Conditions	Min	Тур.	Max	Unit
V _{CE} (sat)	Output Saturation Voltage	$V_{CC} = 14V$, Ic = 20mA	-	300	700	mV
lcex	Output Leakage Current	$V_{CE} = 14V, V_{CC} = 14V$	-	<0.1	10	uA
lcc	Supply Current	V _{CC} = 20V, Output Open	-	5	10	mΑ
tr	Output Rise Time	V _{CC} = 14V, RL = 820Ω, CL = 20pF	-	0.3	1.5	us
tf	Output Falling Time	V _{CC} = 14V, RL = 820Ω, CL = 20pF	-	0.3	1.5	us

Test Circuit





Magnetic Characteristics $(TA = 25^{\circ}C)$

(1mT=10 Gauss)

A grade										
Symbol	Parameter	Min	Тур.	Max	Unit					
Bops(south pole to brand side)	Operate Point	5	-	70	Gauss					
Brps(south pole to brand side)	Release Point	-70	-	-5	Gauss					
Bhy(Bopx – Brpx)	Hysteresis	-	80	-	Gauss					

B grade

Symbol	Parameter	Min	Тур.	Max	Unit
Bops(south pole to brand side)	Operate Point	-	-	100	Gauss
Brps(south pole to brand side)	Release Point	-100	-	-	Gauss
Bhy(Bopx – Brpx)	Hysteresis	-	80	-	Gauss

*B grade is for SIP-3L package only.







Performance Characteristics

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



Marking Information





Package Information (All Dimensions in mm)

(1) Package Type: SIP-3L for Bulk Pack







Package Dimension





Package Information (Continued)

(2) Package Type: SIP-3L for Ammo Pack-only



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