

AN8261

Brushless Motor Driver

Overview

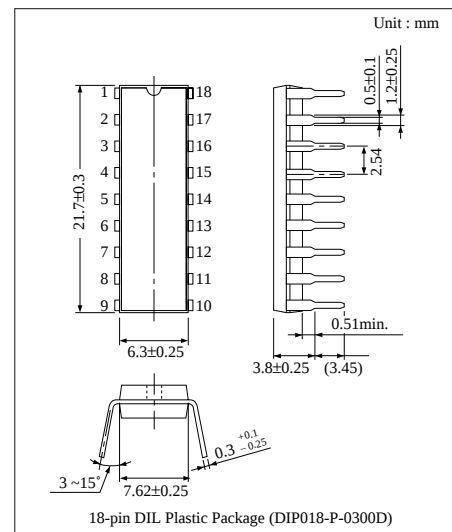
The AN8261 is a 3-phase full-wave brushless motor drive IC and optimum for driving the air conditioner fan motors, etc.

Features

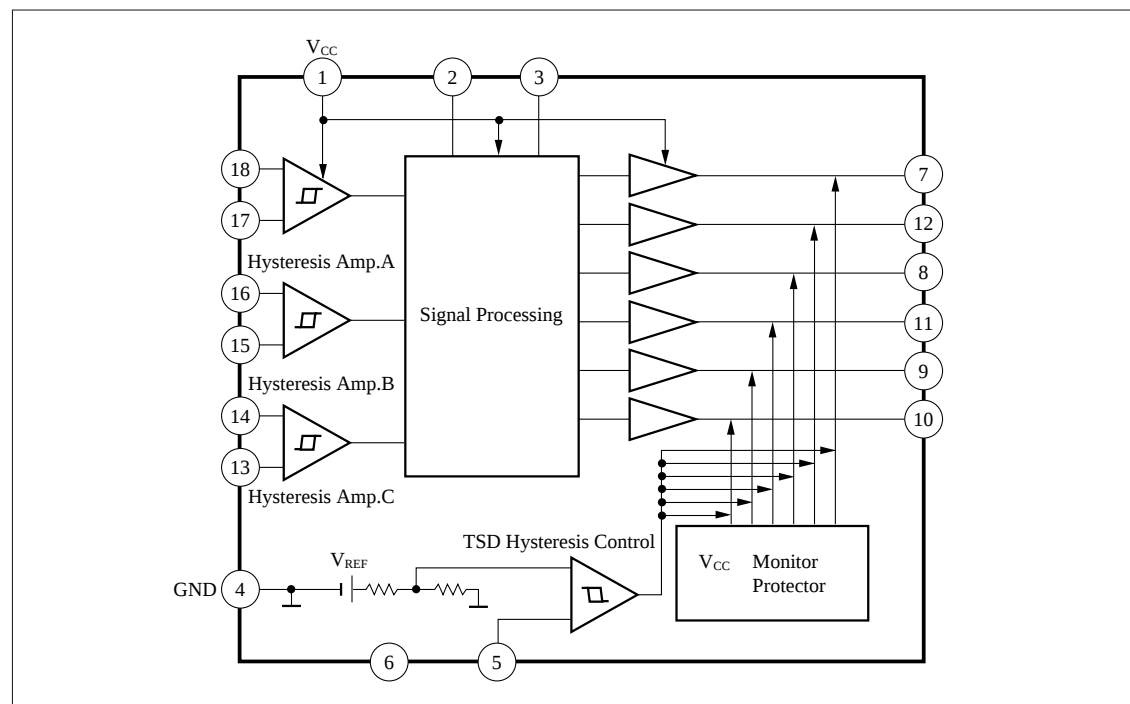
- Operating supply voltage range : $V_{CC} = 4.5$ to $7V$
- 3-phase full-wave drive, external power transistor
- Built-in low-voltage protective circuit
- Built-in thermal protective comparator circuit
- Built-in Hall amplifiers with hysteresis

Applications

Driving the brushless motors such as air conditioner fan motors, etc.



Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	7.5	V
Supply current	I _{CC}	80	mA
Output drive current	I ₇ , I ₈ , I ₉ I ₁₀ , I ₁₁ , I ₁₂	−7 to + 25	mA
Power dissipation	P _D	800	mW
Operating ambient temperature	T _{opr}	−20 to + 80	°C
Storage temperature	T _{stg}	−55 to +150	°C

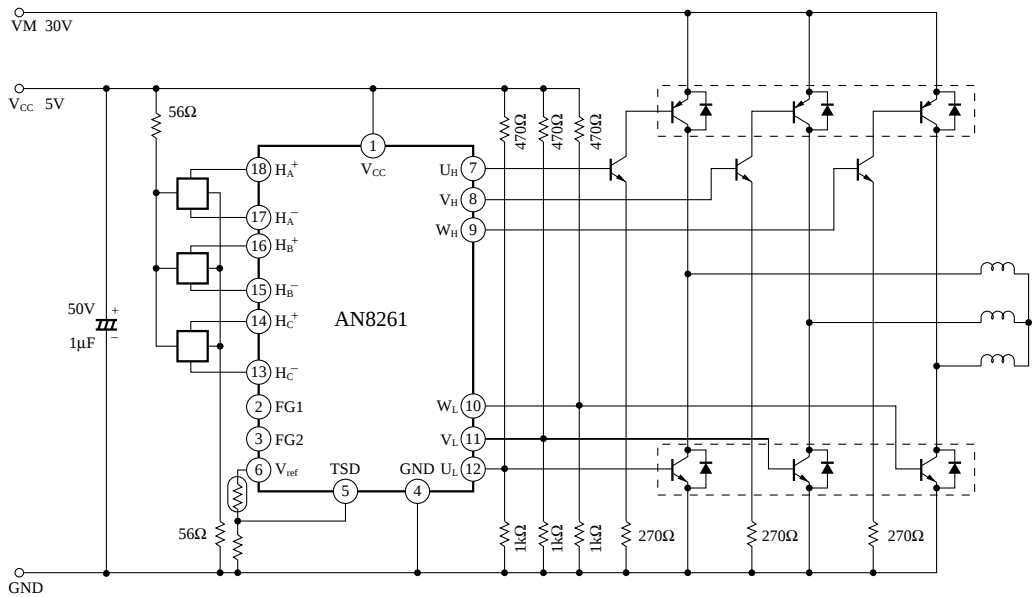
■ Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range
Operating supply voltage range	V _{CC}	4.5V to 7V

■ Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
Supply current 1	I _{CC1}	V _{CC} =5V	—	40	56	mA
Supply current 2	I _{CC2}	V _{CC} =3.5V	—	47	62	mA
Sensor amp. input voltage L to H	V _{SLH}	V _{CC} =5V	1	10	20	mV
Sensor amp. input voltage H to L	V _{SHL}	V _{CC} =5V	−20	−10	−1	mV
FG output voltage low level	V _{OL}	V _{CC} =5V, I _{PO} =5mA	—	—	0.4	V
Power drive output voltage high level	V _{POH}	V _{CC} =5V, I _{PO} =−3mA	3.6	—	—	V
Power drive output current high level	I _{POH}	V _{CC} =5V, V _{PO} =2V	−8	−6	−4	mA
Power drive output voltage low level 1	V _{POL1}	V _{CC} =5V, I _{PO} =10mA	—	—	0.4	V
Power drive output voltage low level 2	V _{POL2}	V _{CC} =5V, I _{PO} =20mA	—	—	0.6	V
Power drive output voltage low level 3	V _{POL3}	V _{CC} =5V, I _{PO} =15mA	—	—	0.6	V
Sensor amp. input voltage hysteresis width	V _{SW}	V _{CC} =5V	12	20	28	mV
FG output pull-up resistance value	R _O	I _W =30μA	8	10	12	kΩ
Protect reset voltage	V _R		3.5	4	4.5	V
Temperature protect operating voltage	V _T	V _{CC} =5V	1	1.15	1.3	V
Temperature protect resetting voltage	V _{TR}	V _{CC} =5V	0.5	0.63	0.8	V
TSD bias current	I _{TSD}	V _{CC} =5V, V _{TSD} =0.5V	—	—	10	μA
Reference voltage	V _{ref}	V _{CC} =5V	2	2.3	2.6	V
Reference voltage regulation	V _{refREGV}	V _{CC} =4V→7V	—	—	0.15	V
Reference voltage load reguration	V _{refREGV}	V _{CC} =5V, I _O =0mA→10mA	—	—	0.1	V
V _{CC} protect hysteresis width	V _{C CW}		100	210	450	mV
Temperature protect operating voltage V _{ref} ratio	V _T /V _{ref}	V _{CC} =5V	48.5	50	51.5	%
Temperature protect operating voltage V _{ref} ratio	V _R /V _{ref}	V _{CC} =5V	25.3	27.4	29.5	%

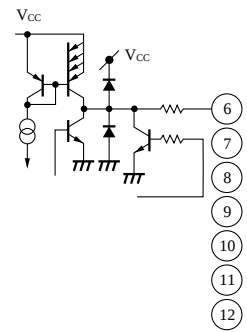
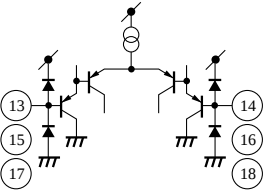
■ Application Circuit



■ Pin Descriptions

Pin No.	Pin name	Description	I/O	DC/waveform	Equivalent circuit
1	V _{CC}	Supply voltage input pin	I	5V	
2	FG1	FG signal output pin	O		
3	FG2	FG signal output pin	O		
4	GND	GND pin	I	0V	
5	TSD	Temperature protect input signal pin	I	—	
6	V _{REF}	Reference voltage output pin (TSD reference voltage)	O	2.3V	

■ Pin Descriptions (cont.)

Pin No.	Pin name	Description	I/O	DC/waveform	Equivalent circuit
7	UH	Power driver output pin	O	—	
8	VH				
9	WH				
10	WL				
11	VL				
12	UL				
13	HC ⁻	Hall element input pin	I	—	
14	HC ⁺				
15	HB ⁻				
16	HB ⁺				
17	HA ⁻				
18	HA ⁺				

■ Logic Diagram

Symbol		No.	1	2	3	4	5	6
		Pin No.						
Input	HA ⁺	18	H	H	L	L	L	H
	HA ⁻	17	L	L	H	H	H	L
	HB ⁺	16	L	H	H	H	L	L
	HB ⁻	15	H	L	L	L	H	H
	HC ⁺	14	L	L	L	H	H	H
	HC ⁻	13	H	H	H	L	L	L
Output	FG ₁	2	L	L	H	H	H	L
	FG ₂	3	L	H	L	H	L	H
	UH	7	L	L	H	H	L	L
	VH	8	L	L	L	L	H	H
	WH	9	H	H	L	L	L	L
	UL	12	H	L	L	L	L	H
	VL	11	L	H	H	L	L	L
	WL	10	L	L	L	H	H	L