AN8261

Brushless Motor Driver

■ Overview

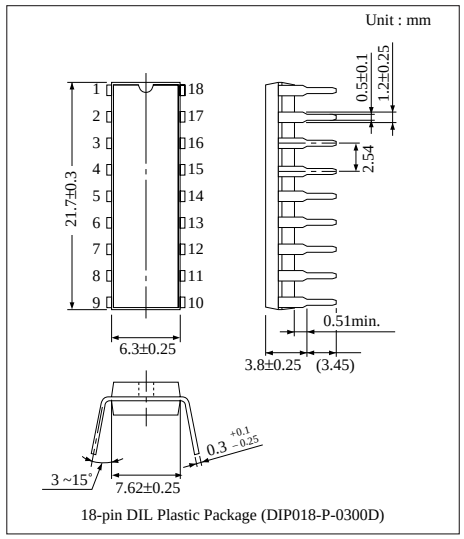
The AN8261 is a 3-phase full-wave brushless motor drive IC and optimum for driving the air conditioner fan motors, etc.

■ 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

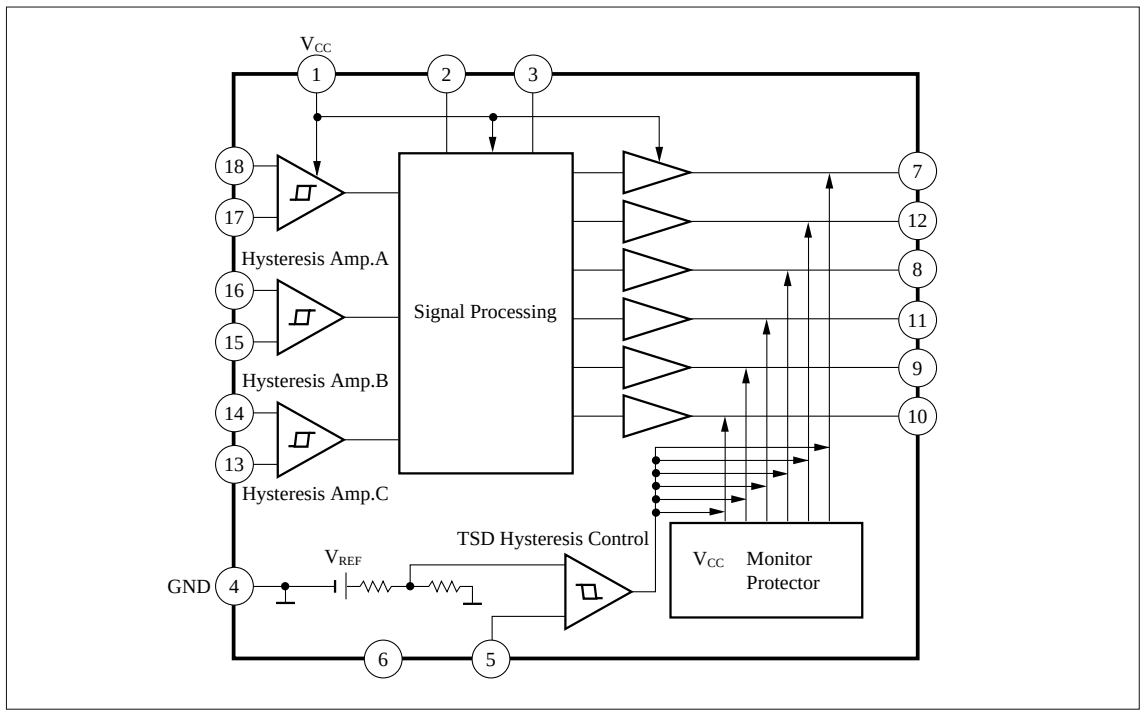
■ Applications

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



18-pin DIL Plastic Package (DIP018-P-0300D)

■ 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

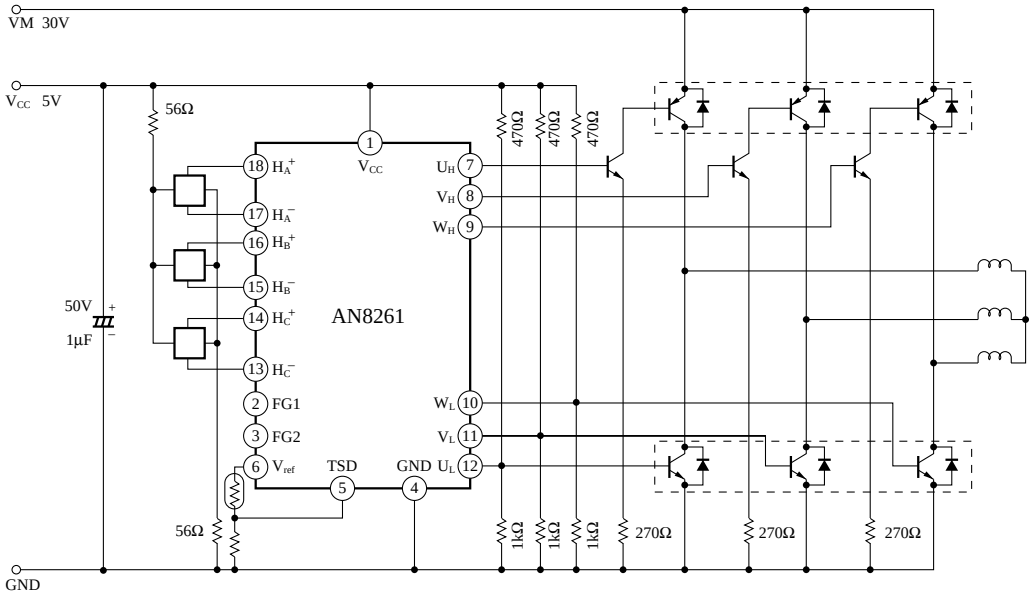
■ Recommended Operating Range (Ta=25˚C)

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

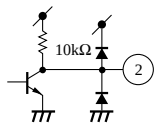
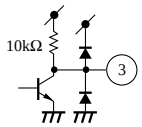
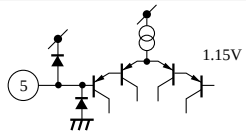
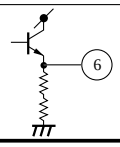
■ Electrical Characteristics (Ta=25˚C)

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_{CCW}		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	%

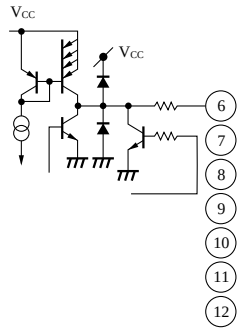
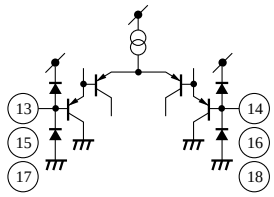
■ Application Circuit



■ 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	5V / 0V	
3	FG2	FG signal output pin	O	5V / 0V	
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. / Pin No.	1	2	3	4	5	6
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