


Specification of Sensorless Based Solution for Ceiling Fan Application							
Motor specifications							
No.	Item	Condition	Specification	Unit	Note	Program GUI	Motor Picture
1	Motor slot level	-		S	slot levels TBD		
2	Motor poles	-	16	P		Motor.h >> Set motor parameters >> Motor parameter Pole	
3	Motor internal resistance (Maximum)	Ru-v	0.66	Ω			
		Rv-w	0.7	Ω			
		Rw-u	0.59	Ω			
4	Motor inductance (Maximum)	Lu-v-	950.6	uH	1KHz		
		Lv-w	1073	uH			
		Lw-u	774	uH			
Blade specifications							
No.	Item	Condition	Specification	Unit	Note		
1	Number of blades	-	3	piece			
2	Blade inch	-	22.5	inch			
3	Single blade weight	-	420	g			
Basic product performance requirements							
No.	Item	Condition	Specification	Unit	Note	Program GUI	
1	Rated Input Voltage	-	12	V			
2	Input voltage range	Min.	6				
		Max.	24				
3	Rated Input Current	-	3.5	A	Vin=15V		
4	Input current range	Min.	0.1				
		Max.	3.5			The maximum input current needs to be limited and must not exceed	
		Steady-State Error	±2	%			
5	Rated input power	-	42	W	Vin=12V		
	Input power range	Min.	2.4				
		Max.	52		Vin=15V		
		Steady-State Error	±2		%		
6	Rated Speed	Min.	100	RPM	Vin=12V	Motor.h >> Set motor control program >> Constant speed control >> Set speed control range Max	
		Max.	330		Vin=12V		
		Steady-State Error	±2		%		
7	System Efficiency	-	η>=80	%			
Protective function							
No.	Item	Function details				Program GUI	
1	Overvoltage protection	■ 1. Enable □ 2. Disable ; If it is option 1 -> the overvoltage value is : 【 24 】 V □ 1. System power off, then restart				Motor.h >> Set motor protection function >> OVP >> OVER_BUS_VOLT_VALUE parameter	
		■ 2. System restart after the expected voltage is recovered. □ 3. other : If it is option 2 -> Re-Start voltage value is : 【 22 】 V				Motor.h >> Set motor protection function >> OVP >> CLEAR_OVER_BUS_VOLT_VALUE parameter	
	Undervoltage protection	Undervoltage value is : 【 5 】 V				Motor.h >> Set motor protection function >> OVP >> UNDER_BUS_VOLT_VALUE parameter	
		Re-Start voltage value is : 【 8 】 V				Motor.h >> Set motor protection function >> OVP >> CLEAR_UNDER_BUS_VOLT_VALUE parameter	
2	Overcurrent protection	□ 1. System power off, then restart ■ 2. Execution restart mechanism □ 3. other:					
3	Over temperature protection	□ 1. Enable ■ 2. Disable; If it is option 1 -> the over temperature value is : 【 - 】 °C				Motor.h >> Set motor protection function >> OTP >> OVER_TEMPERATURE parameter	
		□ 1. System power off, then restart □ 2. System restart after the expected temperature is recovered □ 3. other: If it is option 2 -> Re-Start temperature value is: 【 - 】 °C				Motor.h >> Set motor protection function >> OTP >> CLEAR_OVER_TEMPERATURE parameter	
4	Locked-rotor protection	■ 1. Enable □ 2. Disable □ 1. System power off, then restart ■ 2. Execution restart mechanism □ 3. other:					
5	Restart mechanism	Number of restarts: 【 3 】 times (This is the number of restarts of the above protection mechanism. After the number of times is reached, the power will be restored)				Motor.h >> Set motor protection function >> Set Retry times	
		Restart time : 【 1000 】 ms					



Engineering function details					
No.	Item	Condition	Specification	Unit	Program GUI
1	Control mode		Speed loop	Open Loop/Speed Loop/ Current Loop/Power Loop	Motor.h >> Set motor protection function
2	SVPWM Mode		5-SVPWM	5-SVPWM/7-SVPWM	Moc.h >> MOTOR_CONT2 configuration >> SVPWMMODE
3	PWM frequency		20	KHz	Pwm.h >> MPWMDATA configuration >> Set PWM frequency
4	Short circuit overcurrent value		16	A	
5	Locked-rotor judgment time		200	ms	Motor.h >> Set motor protection function >> Locked-rotor protection >> Locked-rotor protection judgment delay time
6	Fan blade direction		Single direction	Single direction / Forward and reverse	
7	Start steady state time	Reach the rated maximum speed	15	sec	
8	Speed control		<input type="checkbox"/> Power on control, where speed is 【330 rpm】 or duty is 【95%】.		
			<input type="checkbox"/> VSP Control, where start is 【1V】 , stop is 【0.8V】 and max is 【4.5V】.		
			<input type="checkbox"/> PWM Control, where start is 【5%】 , stop is 【3%】 and max is 【95%】 . frequency 【     】		
			<input checked="" type="checkbox"/> RF Control, 【 4 】 level speed		
			<input type="checkbox"/> UART Control		
8-1	RF speed stage value	Speed control selection RF	Speed Level 1 = 100 rpm;		
			Speed Level 2 = 200 rpm;		
			Speed Level 3 = 300 rpm;		
			Speed Level 4 = 330 rpm;		
8-2	RF other function		SMART function ; 3H/6H/9H Timer off ; learn address code		
9	FG Output		<input type="checkbox"/> Pulse output : 【 4 】 / ppr		
			<input checked="" type="checkbox"/> not used.		

Other detailed functions supplement :

- The motor goes from standstill to maximum speed for about 15 seconds.
- Motor forward wind and headwind function.
  - 2-1. When the motor is idling at low speed, brake first and then start.
  - 2-2. When the motor is idling at high speed, direct start at motor.
- RF Function.
  - 3-1. Power-off memory function : memory last speed after power off.
  - 3-2. Speed Controller : 1~4 speed and off motor.
  - 3-3 Learning address code of the remote control : Press long off button to learn address code, learn the remote control address code during this period of time within 5 seconds of power on, and I will not learn it after this time.
  - 3-4 Smart Function : decrease the speed by 1 every two hours. cancellation method is to press off or two hours after the lowest speed.
  - 3-5 Timer shutdown Function : 3H,6H,9H timer to shutdown.
- Buzzer : When I press any button on the remote control, it turns on 200ms.
- LED : Motor error indicator. According to different error codes, the number of flashes can be set by yourself.  
The maximum input current is limited to 3.5A, because the maximum current of the input SMPS can only supply 3.5A.
- Forced motor start : When the customer loses the remote control and cannot start the ceiling fan, After turning on the power, turn off after an interval of 1~2 seconds, then turn on after an interval of 1~2 seconds, and after repeating the operation 3 times, the ceiling fan will run at full speed for the fourth time.

The red letters are the new functions added in the back