HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

1 Features of HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

Fig 1 HMSK4361 External view

- Replacement with MSK4361 of MSK Company
- Continuous output current: 30A
- Motor power voltage: 75V
- Torque control of four-quadrant
- 60/120 phase selection
- Inhibition function

2 Applications of HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

Three-phase brushless motor drive control

Driven reaction load

Servo control

3 Description of HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

HMSK4361 is a exclusive module for brushless DC motor, module inside have the integrated three-phase MOSFET bridge, the MOSFET bridge can provide the maximum power supply voltage is 75V, the maximum output current is 30A. The module is consist of HALL sensor interface circuit, PWM, power amplifier, current detection and current feedback interface and so on.

This series of products are made of thick film hybrid integrated process, metal s ealed package. Product design and manufacturing meet the requirements of MIL-ST D and detailed specifications, the quality level is H-class.

4 Technical Specifications of HMSK4361 Large Current Pul se Width Modulation Amplifier Brushless Motor Driver

Table 2 Electrical Characteristic（Complete according to the standard）

No.	Characteristic	（ Unless other condition，Vcc=15V±5% V_S=-15V±5%，V_S=28V±5% -55℃≤T_c≤125℃）	HMSK4361			Unit
			A group	min	max	
1	+15V power current/I_{CC}	Speed control GND，empty load，Effective HALL signal，frequency:40Hz，V_H≥3V，V_L≤0.8V	1	-	90	mA
	-15V power current /I_{EE}		1	-	40	
2	Clock frequency/fcp	Effective HALL signal，frequency:40Hz，V_H≥3V，V_L≤0.8V	4\5\6	18.7	25.3	KHZ
3	Reference voltage/V_{REF}	RREF=430Ω	1\2\3	5.82	6.57	V
4	Control voltage transconductance/gm	Effective HALL signal，frequency:40Hz，efficient current control setup	4	2.4	3.6	A/V
5	Bias current/I_{OO}	Effective HALL signal，frequency:40Hz，V_H≥3V，V_L≤0.8V	1	-100	100	MA
6	Current monitoring slope/K	Effective HALL signal，frequency:40Hz， effective current control setup	4	0.25	0.45	V/A

5 Pin Designations of HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

Permutation of leading-out terminal is according to Figure 2, it’s a platform view.

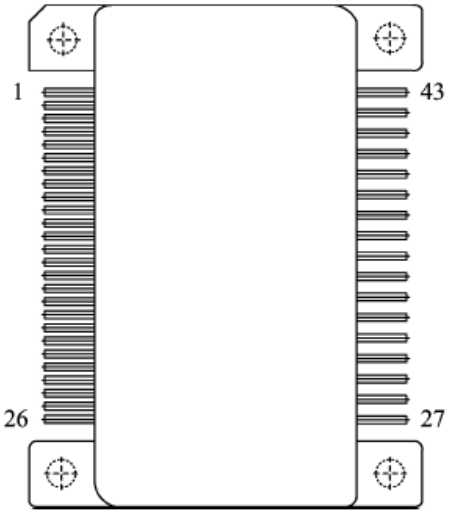

Figure 2 Platform

Table 3 Pin Designations

Pin	Symbol	Designation	Pin	Symbol	Designation
1	V_{REF}	Reference voltage output	23	GND	Ground
2	$IN_{HALL\ A}$	A phase HALL signal	24	NC	NULL
3	$IN_{HALL\ B}$	B phase HALL signal	25	NC	NULL
4	$IN_{HALL\ C}$	C phase HALL signal	26	GND_L	Detection ground
5	$CON_{60/60/12}$	Phase control terminal	27	GND_P	Power ground
6	CON_{BRAKE}	Motor braking control	28	GND_P	Power ground
7	SYNC	Clock synchronization	29	GND_{PC}	C phase power ground
8	CON_{DIS}	Enable control	30	GND_{PC}	C phase power ground
9	GND	Ground	31	OUT_C	C phase output
10	NC	NULL	32	OUT_C	C phase output
11	NC	NULL	33	V_{SC}	C phase power Drive supply
12	$OUT_{E/A}$	Error amplifier output	34	GND_{PB}	B phase power ground

13	$IN_{E/A-}$	Reverse input of error amplifier	35	GND_{PB}	B phase power ground
14	GND	Ground	36	OUT_B	B phase output
15	CON_+	Control positive	37	OUT_B	B phase output
16	CON_-	Control negative	38	V_{SB}	B phase power Drive supply
17	V_{CC}	+15V supply	39	GND_{PA}	A phase power ground
18	$TEST_I$	Current detection	40	GND_{PA}	A phase power ground
19	V_{EE}	-15V supply	41	OUT_A	A phase output
20	NC	NULL	42	OUT_A	A phase output
21	NC	NULL	43	V_{SA}	A phase power Drive supply
22	NC	NULL			

6 Circuit block diagram of HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

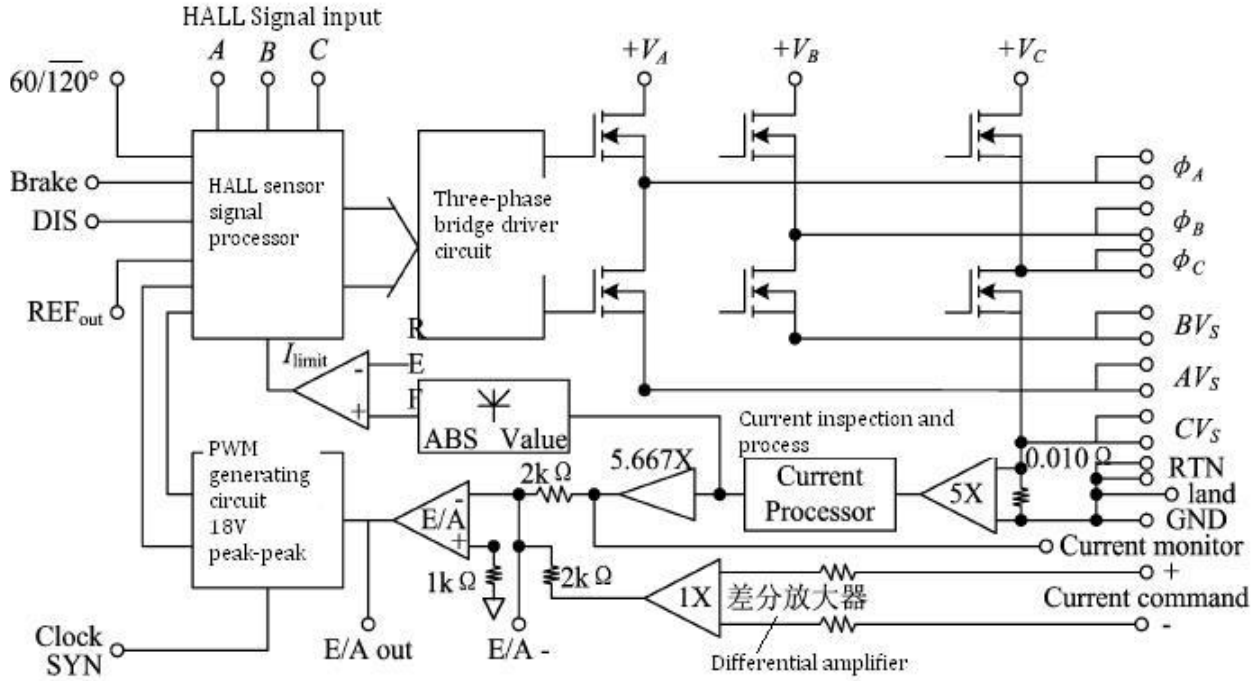

Figure 3 Single-circuit block diagram

7. Typical Connection Diagram of HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

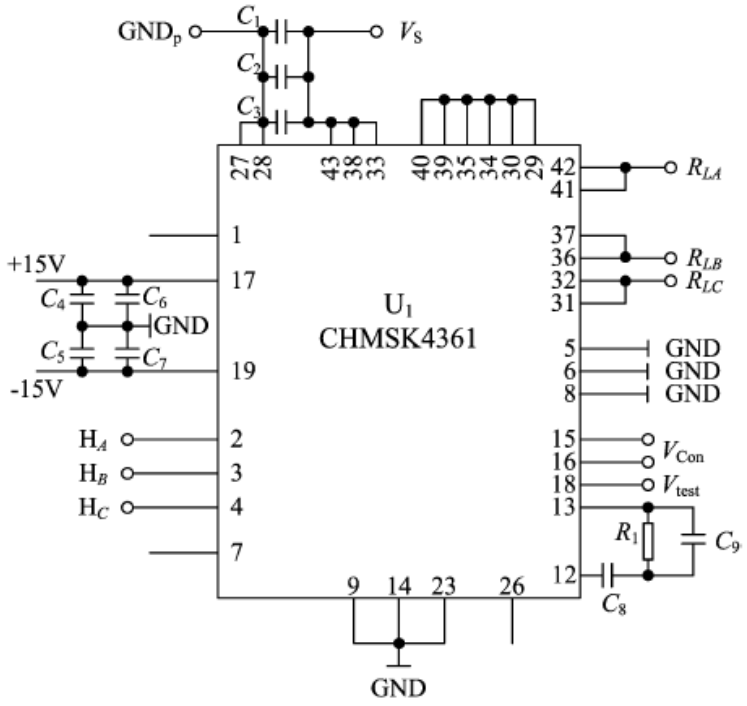

Fig 4 HMSK4361 connection diagram

Note1: C_1=C_2≥470μf/100V（choose according to need），C_3≥78μf/100V（choose according to need）

Note2: C_4=C_5≥10μf/50V ， C_6=C_7=0.1μf±5%/50V ， C_8=0.33μf±5%/50V ， C_9=0.01μf±5%/50V，R_1=2KΩ±5%

Note3: V_{CC}=15V±5%,Vee=-15V±5%,V_S=28V±5%

Note4: 7V≥V_{CON}≥2V

Note5: $HALL_A$、$HALL_B$ 和 $HALL_C$ phase shift 120°，TTL square wave.

8. Package Specifications of HMSK4361 Large Current Pulse Width Modulation Amplifier Brushless Motor Driver

Outline of package is shown in Figure 5:

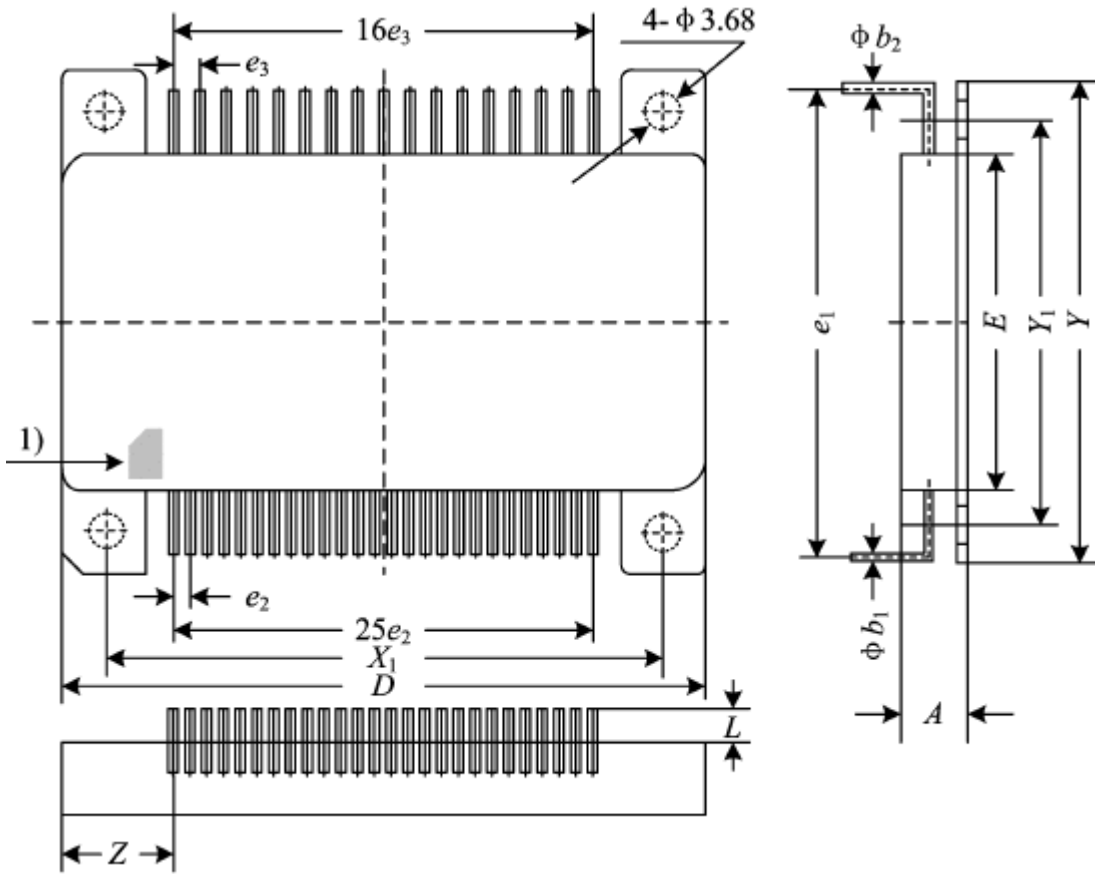

Table 4 Package outline

Symbols	Data /mm		
	Minimum	Typical	Minimum
A	-	-	10.03
Φb1	0.45	-	0.60
Φb2	0.90	-	1.10
D	-	-	78.99
X1	-	72.39	-
e2	-	2.54	-
e3	-	3.81	-
E	-	-	40.89
Y1	-	47.24	-
Y	-	-	*53.59*
e1	-	53.34	-
Z	-	-	7.9
L	3.05	-	-

Application Notes please refer to the appendix, must read it carefully