BLDC Motherboard pins definition (CN94)

|  |  |  |
| --- | --- | --- |
| Pin No. | Function | Description |
| 1 | GK | If over current or low voltage protection is triggered in gate driver, this pin gives the following:

|  |  |
| --- | --- |
| VGK |  |
| 3.3V | Gate driver work in normal |
| 0V | Gate driver in protection |

 |
| 2 | PWMWH | High-side IGBT voltage level for **W** phase:

|  |  |
| --- | --- |
| VPWMWH |  |
| >2.4V | IGBT on |
| <0.7V | IGBT off |

 |
| 3 | PWMWL | Low-side IGBT voltage level for **W** phase:

|  |  |
| --- | --- |
| VPWMWL |  |
| >2.4V | IGBT on |
| <0.7V | IGBT off |

 |
| 4 | PWMVH | High-side IGBT voltage level for **V** phase:

|  |  |
| --- | --- |
| VPWMVH |  |
| >2.4V | IGBT on |
| <0.7V | IGBT off |

 |
| 5 | PWMVL | Low-side IGBT voltage level for **V** phase:

|  |  |
| --- | --- |
| VPWMVL |  |
| >2.4V | IGBT on |
| <0.7V | IGBT off |

 |
| 6 | PWMUH | High-side IGBT voltage level for **U** phase:

|  |  |
| --- | --- |
| VPWMUH |  |
| >2.4V | IGBT on |
| <0.7V | IGBT off |

 |
| 7 | PWMUL | Low-side IGBT voltage level for **U** phase:

|  |  |
| --- | --- |
| VPWMUL |  |
| >2.4V | IGBT on |
| <0.7V | IGBT off |

 |
| 8 | RSH+ | 1. DC Bus Current feedback detection，Rshunt =0.1Ω

Feedback signal level VRSH+ = 0.1\*IDCBUSFor example:

|  |  |
| --- | --- |
| RSH+ Voltage VRSH+ | DC BUS current IDCBUS |
| 0.2V | 2A |

1. If VRSH+ > 0.88V, the gate driver over current protection (OCP) will be triggered and all PWM pins turn off
 |
| 9 | HV- | HV- ground pin |
| 10 | +5V | +5V output |
| 11 | +3.3 | +3.3V output |
| 12 | VTH | IGBT temperature detection pin using a thermistor RRTH4 placed near Q901.The relation between RRTH4 resistance and temperature is as follow：

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Temperature ℃ | 0 | 25 | 50 | 100 | 110 | 120 |
| Resistance Ω | 27k | 10k | 4.13k | 0.96k | 0.75k | 0.60k |

RTH4 type: TSM2A103F34D1R (Thinking Electronic) |
| 13 | BRAKE | Shunt braking resistor trigger level.This function is recommended when DC Bus> 400V.An external regenerative resistor (300Ω recommended) on CN100 of motherboard is required.

|  |  |
| --- | --- |
| VBRAKE |  |
| >3V | Regenerative resistor off |
| <0.5V | Regenerative resistor on |

 |
| 14 | Eempty pin |  |
| 15 | HV1 | 380V DC Bus voltage detection.R948 (665kΩ) on motherboard together with another resistor on daughterboard are used as voltage divider for DC Bus (HV+) detection. |

Control daughter board pins definition (CN93)

|  |  |  |
| --- | --- | --- |
| Pin No. | Function | Description |
| 1 | +5V | +5VDC output pin; Max. current 0.2A |
| 2 | Hall detection 1 | Digital Hall IC detection input 1 pin (No needed in case default MCU firmware is used) |
| 3 | Hall detection 3 | Digital Hall IC detection input 3 pin (No needed in case default MCU firmware is used) |
| 4 | Hall detection 2 | Digital Hall IC detection input 2 pin (No needed in case default MCU firmware is used) |
| 5 | GND | Ground pin for Hall IC, speed control and Start/stop |
| 6 | Rotating speed | Input pin for speed controlForward rotation (0~100%): 5~9.6V Reverse rotation (0~100%): 5~0.4V |
| 7 | Start/Stop | Input pin for motor start or stopStart: +5VStop: open |
| 8 | Empty pin |  |
| 9 | TXD | RS-232 TX signal |
| 10 | RXD | RS-232 RX signal |