



## SERIES: PCM-400 | DESCRIPTION: AC-DC POWER SUPPLY

### FEATURES

- up to 400 W continuous power
- universal input (90~264 Vac)
- active power factor correction
- peak power of 700W for 500 $\mu$ s duration (single output models only)
- built-in remote ON/OFF, power good, & fan fail alarm options
- over voltage, short circuit, over current, and over temperature protection
- efficiency up to 87%



| MODEL                        |     | preset<br>output<br>voltage<br><br>(Vdc) | customizable<br>output<br>range <sup>7</sup><br><br>(Vdc) | output<br>current          |                            | output<br>power<br><br>max<br>(W) | ripple<br>and noise <sup>8,9</sup><br><br>max<br>(mVp-p) | efficiency<br><br>typ<br>(%) |
|------------------------------|-----|--|---|----------------------------|----------------------------|-----------------------------------|--|------------------------------|
|                              |     |  |   | max<br>(forced air)<br>(A) | max<br>(convection)<br>(A) |                                   |  |                              |
| PCM-400-12 <sup>1,2</sup>    |     | 12                                       | 10~13.8   | 33.33                      | 18.33                      | 400                               | 120  | 85                           |
| PCM-400-15 <sup>1,2</sup>    |     | 15                                       | 14~15.5   | 26.67                      | 14.67                      | 400                               | 150  | 85                           |
| PCM-400-18 <sup>1,2</sup>    |     | 18                                       | 16~20   | 22.22                      | 12.22                      | 400                               | 180  | 85                           |
| PCM-400-24 <sup>1,2</sup>    |     | 24                                       | 21~26   | 16.67                      | 9.17                       | 400                               | 240  | 87                           |
| PCM-400-28 <sup>1,2</sup>    |     | 28                                       | 27~34   | 14.29                      | 7.86                       | 400                               | 280  | 85                           |
| PCM-400-36 <sup>1,2</sup>    |     | 36                                       | 35~42   | 11.11                      | 6.11                       | 400                               | 360  | 87                           |
| PCM-400-48 <sup>1,2</sup>    |     | 48                                       | 43~50   | 8.33                       | 4.58                       | 400                               | 480  | 87                           |
| PCM-400-54 <sup>1,2</sup>    |     | 54                                       | 51~60   | 7.41                       | 4.07                       | 400                               | 540  | 87                           |
| PCM-400-D0512 <sup>3,4</sup> | Vo1 | 5  | N/A   | 30                         | 15                         | 320                               | 50   | 87                           |
|                              | Vo2 | 12                                       |   | 20.83                      | 13.33                      |                                   | 120  |                              |
| PCM-400-D0524 <sup>3,4</sup> | Vo1 | 5  | N/A   | 30                         | 15                         | 320                               | 50   | 87                           |
|                              | Vo2 | 24                                       |   | 10.42                      | 6.67                       |                                   | 240  |                              |
| PCM-400-D0548 <sup>3,4</sup> | Vo1 | 5  | N/A   | 30                         | 15                         | 320                               | 50   | 87                           |
|                              | Vo2 | 48                                       |   | 5.21                       | 3.33                       |                                   | 480  |                              |
| PCM-400-D1224 <sup>5,6</sup> | Vo1 | 12                                       | N/A   | 20.83                      | 12.5                       | 400                               | 120  | 87                           |
|                              | Vo2 | 24                                       |   | 10.42                      | 8.33                       |                                   | 240  |                              |

- Notes:
1. For U-frame models, the maximum output power is 400W with a minimum of 27 CFM forced air, 220 W maximum with convection cooling.
  2. For CNF models, the maximum output is 220 W with convection cooling.
  3. For U-frame models, the total combined output power is 320W with a minimum of 27 CFM forced air, 180 W maximum with convection cooling.
  4. For CNF models, the maximum output is 180 W with convection cooling.
  5. For U-frame models, the total combined output power is 400W with a minimum of 27 CFM forced air, 200 W maximum with convection cooling.
  6. For CNF models, the maximum output is 200 W with convection cooling.
  7. Output can be custom set within range.
  8. Measured at 10 kHz ~ 20 MHz bandwidth, with a 22  $\mu$ F electrolytic and 0.1  $\mu$ F ceramic capacitor on the output.
  9. 1% minimum load is required to maintain ripple and regulation (10% for dual output models).

### PART NUMBER KEY



## INPUT

| parameter               | conditions/description   | min | typ | max | units |
|-------------------------|--|-----|-----|-----|-------|
| voltage                 |  | 90  |     | 264 | Vac   |
| frequency               |  | 47  |     | 63  | Hz    |
| current                 | at 90 Vac, full load   |     | 8   |     | A     |
| inrush current          | at 115 Vac, cold start   |     |     | 35  | A     |
|                         | at 230 Vac, cold start   |     |     | 70  | A     |
| leakage current         | at 120 Vac   |     |     | 300 | μA    |
|                         | at 240 Vac   |     |     | 500 | μA    |
| power factor correction | at 230 Vac, full load  | 0.9 |     |     |       |
| remote ON/OFF           | designated as INH on Pin 4 of CN1, requires a low signal to inhibit output |     |     |     |       |
| input fuse              | T8 A/250 V on the input  |     |     |     |       |

## OUTPUT

| parameter                  | conditions/description   | min | typ | max | units |
|----------------------------|--|-----|-----|-----|-------|
| total regulation           | single output models   |     | ±1  |     | %     |
|                            | dual output models   |     | ±5  |     | %     |
| transient response         | returns to within 1% in <2.5 ms for a 50% load change and the peak transient does not exceed 5%  |     |     |     |       |
| start-up time              | at 120 Vac   |     |     | 1.5 | s     |
| hold-up time               | at 120 Vac, 75% load   | 16  |     |     | ms    |
| adjustability <sup>1</sup> | built in trim pot  |     | ±5  |     | %     |
|                            | PFC  |     | 68  |     | kHz   |
| switching frequency        | PWM  |     | 55  |     | kHz   |
|                            | all single output models & PCM-400-D1224<br>all other dual output models   |     | 50  |     | kHz   |
| fan drive                  | 12 Vdc/300 mA for external fan   |     |     |     |       |
| fan fail (FF)              | Designated as FF on Pin 3 of CN1, open collector output rated for 15Vdc/5mA max sink current. It goes high when a fan failure is detected. |     |     |     |       |
| power good (PG)            | Designated as PG on CN1, TTL high 100~500 ms after DC regulation. It goes low at least 1 ms before loss of regulation.                     |     |     |     |       |
| power supply on            | green LED designated as LED1 on the PCB  |     |     |     |       |

Note: 1. U-Frame versions only

## PROTECTIONS

| parameter                   | conditions/description                         | min | typ | max | units |
|-----------------------------|--|-----|-----|-----|-------|
| short circuit protection    | auto restart                                   |     |     |     |       |
| over current protection     | auto restart                                   | 110 |     | 140 | %     |
| over voltage protection     | output latches, must recycle ac input to reset |     | 130 |     | %     |
| over temperature protection | auto restart                                   | 105 | 110 | 115 | °C    |

## SAFETY & COMPLIANCE

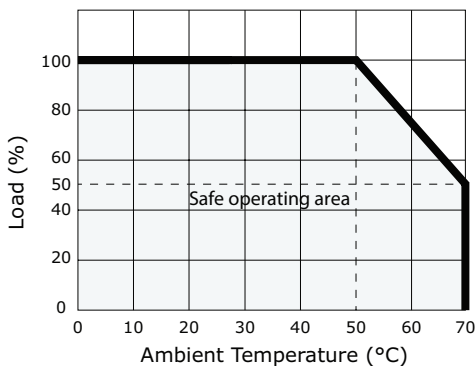
| parameter            | conditions/description  | min     | typ | max | units |
|----------------------|---|---------|-----|-----|-------|
| isolation voltage    | input to output, for 3 sec.   | 3,000   |     |     | Vac   |
|                      | input to core, for 3 sec.   | 1,500   |     |     | Vac   |
|                      | input to chassis (10 mA AC cut-off current), for 3 sec.   | 1,500   |     |     | Vac   |
| safety approvals     | UL/cUL, TUV   |         |     |     |       |
| safety standards     | UL 60950-1, EN 60950-1  |         |     |     |       |
| EMI/EMC <sup>2</sup> | EN 55022 Class B (conducted/radiated), EN 61000-3-(2,3),<br>EN 55024, IEC 61000-4-(2, 3, 4, 5, 6, 11), CE |         |     |     |       |
| MTBF                 | as per MIL-HDBK-217F at 30°C  | 100,000 |     |     | hrs   |
| RoHS                 | 2011/65/EU  |         |     |     |       |

Note: 2. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.

## ENVIRONMENTAL

| parameter             | conditions/description                 | min | typ   | max | units |
|-----------------------|--|-----|-------|-----|-------|
| operating temperature | see derating curve                     | 0   |       | 70  | °C    |
| storage temperature   |  | -20 |       | 85  | °C    |
| operating humidity    | non-condensing                         | 5   |       | 90  | %     |
| storage humidity      | non-condensing                         | 5   |       | 95  | %     |
| vibration             | at 5~50 Hz, along the X, Y, and Z axis |     | ±0.75 |     | G     |

## DERATING CURVE



## MECHANICAL

| parameter  | conditions/description                  | min | typ | max | units |
|------------|---|-----|-----|-----|-------|
| dimensions | U-frame models: 152.40 x 101.60 x 38.10 |     |     |     | mm    |
|            | CNF models: 152.40 x 101.60 x 39.90     |     |     |     | mm    |
|            | CF models: 152.40 x 101.60 x 54.45      |     |     |     | mm    |
|            | CFS models: 177.80 x 101.60 x 40.64     |     |     |     | mm    |
| weight     | U-frame models                          |     | 600 |     | g     |
|            | CNF models                              |     | 650 |     | g     |
|            | CF models                               |     | 800 |     | g     |
|            | CFS models                              |     | 750 |     | g     |

## MECHANICAL DRAWING - SINGLE OUTPUT MODELS

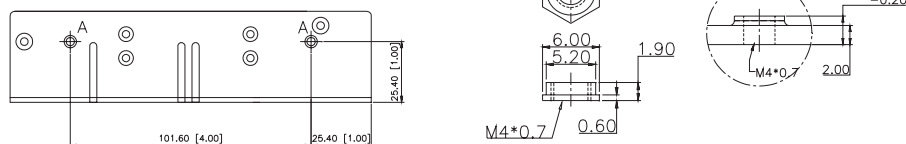
### U-FRAME

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1~2            | +Vo      | 1~5    | +Vo      |
| 3~4            | -Vo      | 6~10   | -Vo      |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



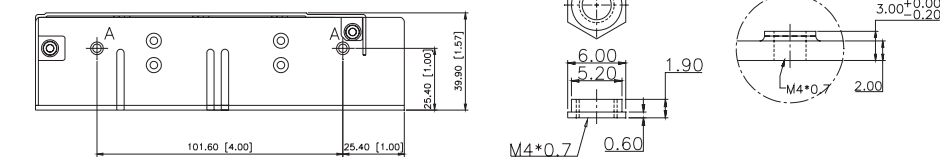
### CNF

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1~2            | +Vo      | 1~5    | +Vo      |
| 3~4            | -Vo      | 6~10   | -Vo      |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



- Notes:
1. CN1 mates with JST XHP-4 or equivalent (CHYAO SHIUNN JS-2001-04) and JST SXH-002T-P0.6 mating pins (30~26 AWG).
  2. CN2: Terminal Block option is Howder Part No. HD-121-7P. Header option mates with JST VHR-5 (input) and VHR-10 (output).
  3. Fan drive connector (Fan1) mates with JST Part No. XHP-2 or equivalent (CHYAO SHIUNN JS-2001-02).
  4. Mounting hole max screw depth is 2.0mm (M4x0.7 Inserts).

# MECHANICAL DRAWING - SINGLE OUTPUT MODELS (CONTINUED)

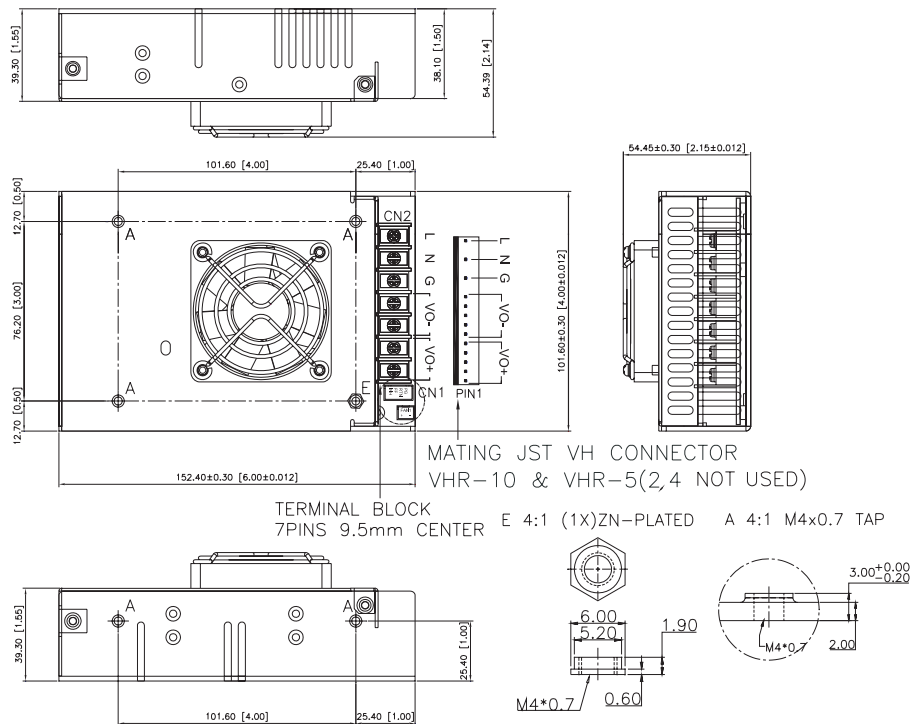
## CF

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1~2            | +Vo      | 1~5    | +Vo      |
| 3~4            | -Vo      | 6~10   | -Vo      |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



## CFS

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1~2            | +Vo      | 1~5    | +Vo      |
| 3~4            | -Vo      | 6~10   | -Vo      |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



- Notes:
1. CN1 mates with JST XHP-4 or equivalent (CHYAO SHIUNN JS-2001-04) and JST SXH-002T-P0.6 mating pins (30~26 AWG).
  2. CN2: Terminal Block option is Howder Part No. HD-121-7P. Header option mates with JST VHR-5 (input) and VHR-10 (output).
  3. Fan drive connector (Fan1) mates with JST Part No. XHP-2 or equivalent (CHYAO SHIUNN JS-2001-02).
  4. Mounting hole max screw depth is 2.0mm (M4x0.7 Inserts).

## MECHANICAL DRAWING - DUAL OUTPUT MODELS

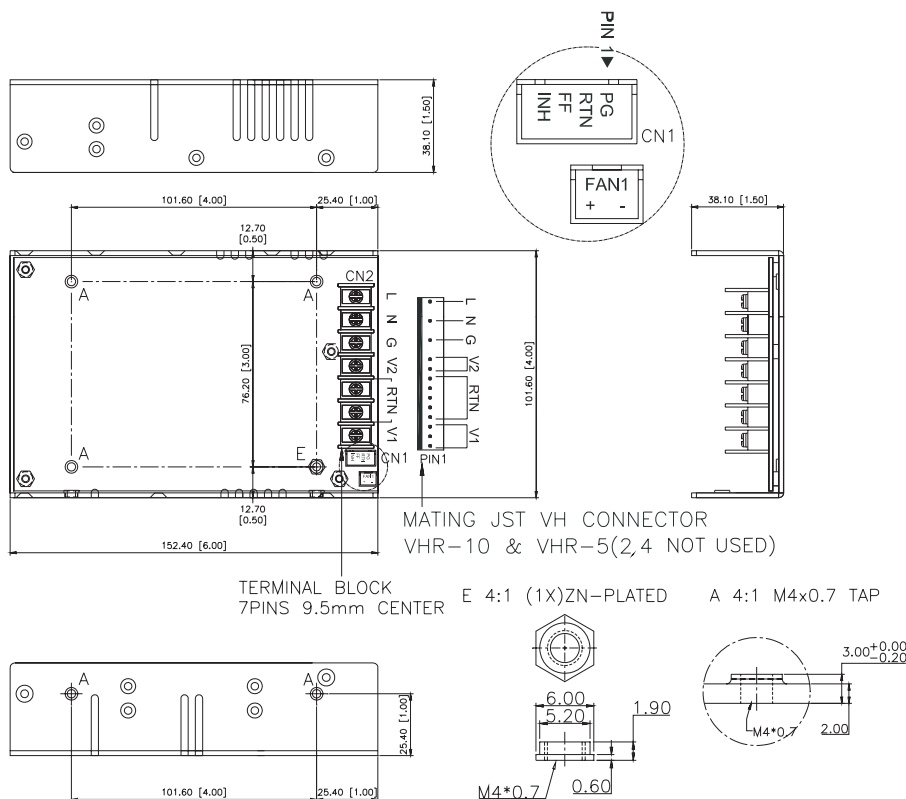
### U-FRAME

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1              | +Vo1     | 1~3    | +Vo1     |
| 2~3            | RTN      | 4~8    | RTN      |
| 4              | +Vo2     | 9~10   | +Vo2     |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



### CNF

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1              | +Vo1     | 1~3    | +Vo1     |
| 2~3            | RTN      | 4~8    | RTN      |
| 4              | +Vo2     | 9~10   | +Vo2     |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



- Notes:
1. CN1 mates with JST XHP-4 or equivalent (CHYAO SHIUNN JS-2001-04) and JST SXH-002T-P0.6 mating pins (30~26 AWG).
  2. CN2: Terminal Block option is Howder Part No. HD-121-7P. Header option mates with JST VHR-5 (input) and VHR-10 (output).
  3. Fan drive connector (Fan1) mates with JST Part No. XHP-2 or equivalent (CHYAO SHIUNN JS-2001-02).
  4. Mounting hole max screw depth is 2.0mm (M4x0.7 Inserts).

## MECHANICAL DRAWING - DUAL OUTPUT MODELS (CONTINUED)

### CF

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1              | +Vo1     | 1~3    | +Vo1     |
| 2~3            | RTN      | 4~8    | RTN      |
| 4              | +Vo2     | 9~10   | +Vo2     |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



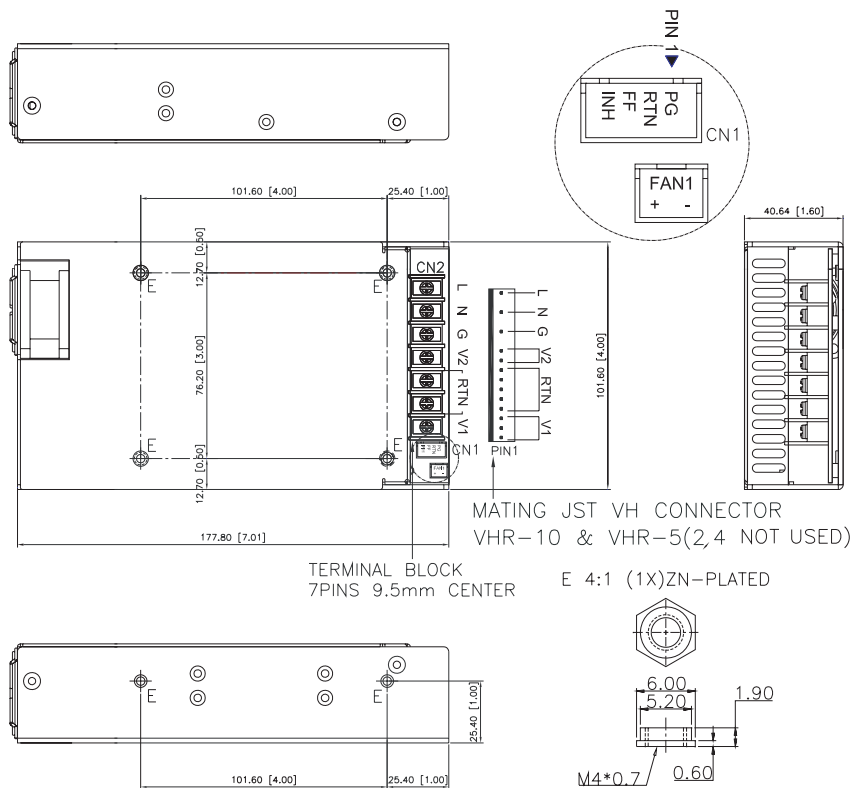
### CFS

units: mm[inch]

| CN1 |          |
|-----|----------|
| PIN | Function |
| 1   | PG       |
| 2   | RTN      |
| 3   | FF       |
| 4   | INH      |

| CN2            |          |        |          |
|----------------|----------|--------|----------|
| Terminal Block |          | Header |          |
| PIN            | Function | PIN    | Function |
| 1              | +Vo1     | 1~3    | +Vo1     |
| 2~3            | RTN      | 4~8    | RTN      |
| 4              | +Vo2     | 9~10   | +Vo2     |
| 5              | GND      | 12     | GND      |
| 6              | N        | 14     | N        |
| 7              | L        | 16     | L        |

| Fan1 |          |
|------|----------|
| PIN  | Function |
| 1    | +FAN     |
| 2    | -FAN     |



- Notes:
1. CN1 mates with JST XHP-4 or equivalent (CHYAO SHIUNN JS-2001-04) and JST SXH-002T-P0.6 mating pins (30~26 AWG).
  2. CN2: Terminal Block option is Howder Part No. HD-121-7P. Header option mates with JST VHR-5 (input) and VHR-10 (output).
  3. Fan drive connector (Fan1) mates with JST Part No. XHP-2 or equivalent (CHYAO SHIUNN JS-2001-02).
  4. Mounting hole max screw depth is 2.0mm (M4x0.7 Inserts).

## REVISION HISTORY

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| rev. | description       | date       |
|------|-------------------|------------|
| 1.0  | initial release   | 07/16/2014 |
| 1.01 | updated datasheet | 12/02/2014 |

The revision history provided is for informational purposes only and is believed to be accurate.

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