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Compute Project

# **Power Connection and Power Distribution Module**

V1.0

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## 2. Scope

This document defines the technical specifications for the “Power Connection & Power Distribution Module” used in Open Compute Project servers.

## 3. Overview

This power module allows blind mate connection of a server to busbars.

The power module consists in an electronic board with connectors soldered on it. This electronic board is designed to allow misalignment between the server and the busbars.

Moreover, the power module provides multiple power connectors for modular and easy connection of the different components inside the server.

## 4. Rack compatibility

The power module is compatible with either OCP Rack V1 or OCP Rack V2 12V busbars specifications.

## 5. Connectors

This power module has 1 dual busbar connector and 5 board-to-wire connectors.

### 5.1 Busbar Connector

This connector is a dual busbar connector used as input connector. It is soldered to the PCB of the power module. This connector is especially designed for blind-mate connection to the busbars. Busbars shall meet requirement of OCP Rack.

Reference: 2C-OCP-CO-001

Manufacturer: 2CRSI

Designation: Barklip R/A CONNECTOR

Solder process capability: Wave

Flammability: UL94V-0

Operating current rating: up to 150A<sup>1</sup>

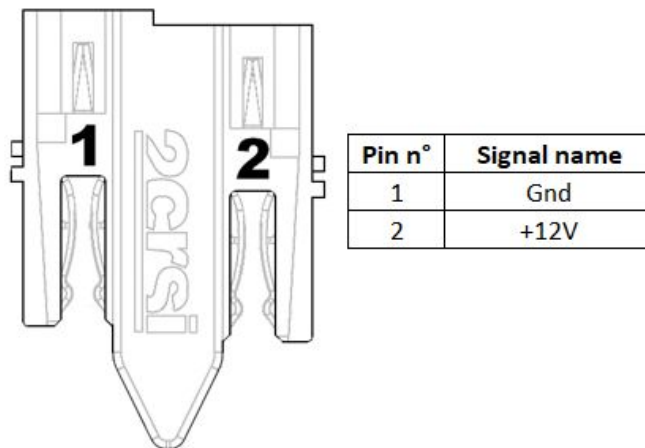


FIGURE 1: BUSBAR CONNECTOR PIN ASSIGNMENT

<sup>1</sup> This value must be reduced according to the designed path-width and copper thickness on the board

## 5.2 Board-to-wire connectors

Reference: 39-28-8040 (or equivalent)

Manufacturer: Molex (or equivalent)

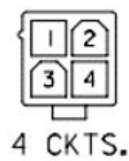
Designation: Vertical Header, 4.20mm Pitch, Dual Row, 4 Circuits

Operating current rating: 8A/pin

Solder process capability: Wave

Flammability: UL94V-0

Pin assignment:



Pin n°	Signal name
1	Gnd
2	Gnd
3	+12V
4	+12V

FIGURE 2: BOARD-TO-WIRE CONNECTOR PIN ASSIGNMENT

## 6. Mechanical

### 6.1 Mechanical Drawing

Refer to 3D CAD file and DXF for full dimensions.

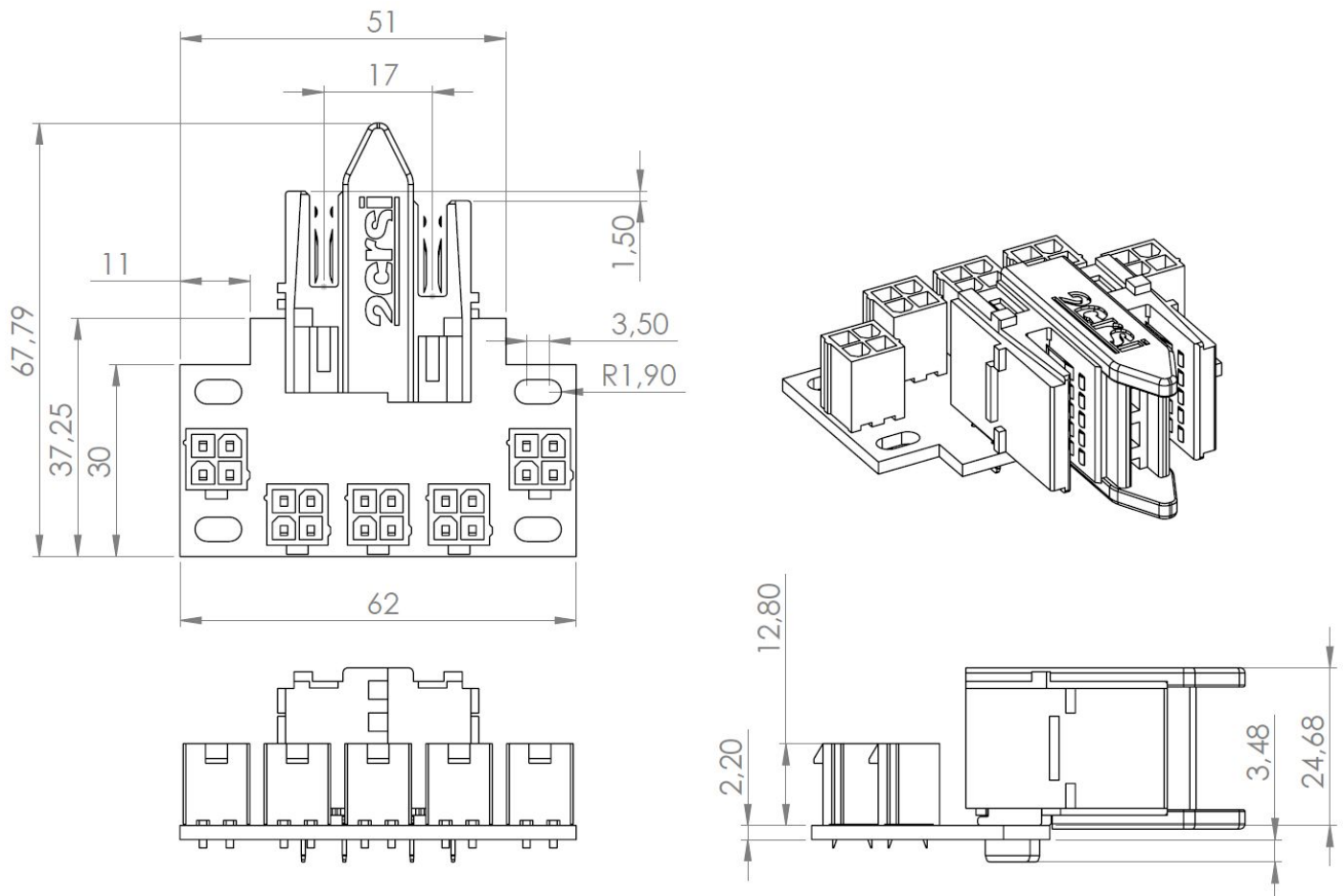


FIGURE 3: POWER MODULE MECHANICAL DRAWING

## 6.2 Panel clearance

Panel clearance should allow for a horizontal displacement of at least 2mm in both direction and 2mm height above the busbar connector.

The horizontal mechanical float is 1.75mm in each direction and the vertical float is 0mm.

The design of the panel clearance depends on your global design and the positioning of the power module in your application.

The following figures are examples of a panel clearance in situation:

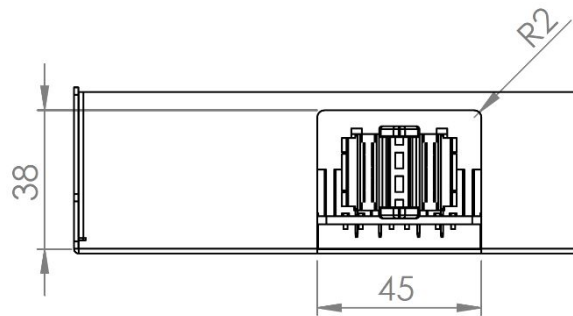


FIGURE 4: PANEL CLEARANCE DIMENSIONS

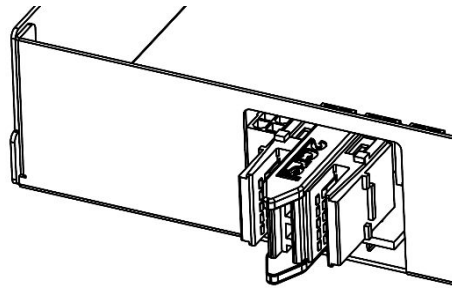


FIGURE 5: PANEL CLEARANCE VIEW

## 6.3 Holes position

The following figure shows the position of the holes where recommended standoffs should be mounted.

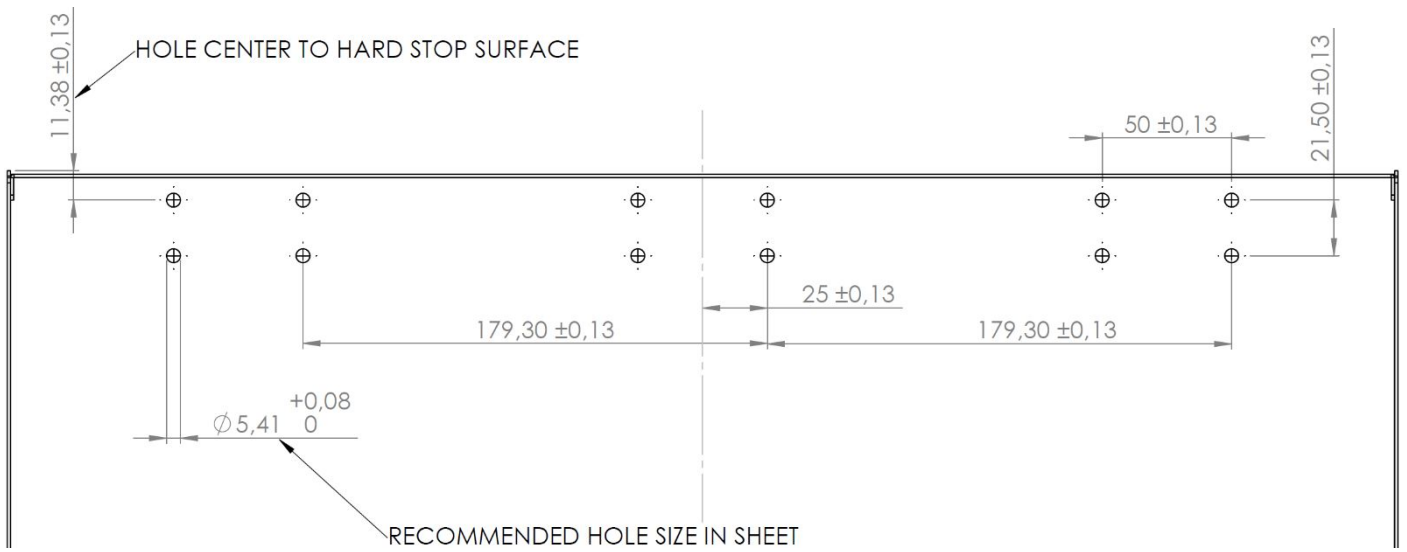


FIGURE 6: HOLES POSITION



## 6.4 Standoff and Screw

Standoff specification:

- Designation: Self clinching standoff – Through-hole threaded
- Manufacturer: PEM
- Reference: SO-3.5M3-8

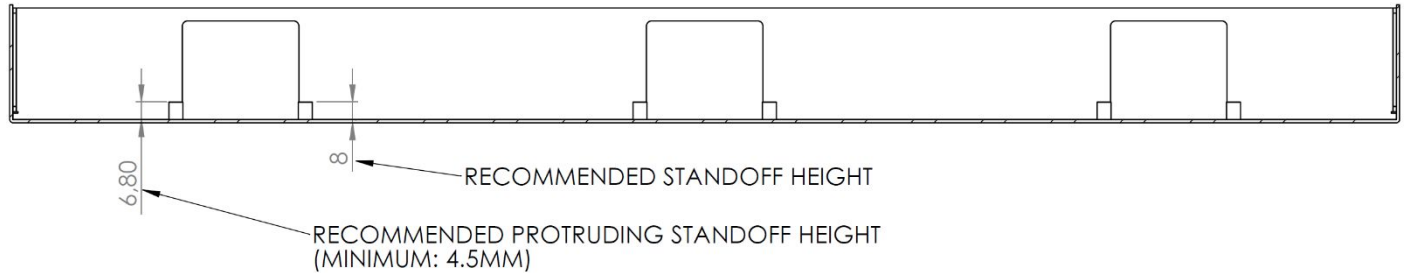


FIGURE 7: STANDOFF DETAILS

The screws needed to maintain the power module while letting him float horizontally are shoulder-screws.

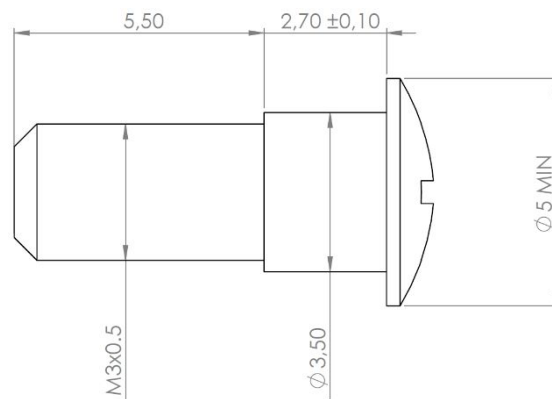


FIGURE 8: SCREW DETAILS

## 7. Electrical

### 7.1 Stack-Up and PCB Thickness

This PCB is composed of 2 copper layers. The copper thickness on each layer must be defined at 140µm, in order to be compatible with the current rating.

To respect the mechanical constraints and remain within the card's mobility tolerances, the PCB thickness must be fixed at 2.2mm. The tolerances on the PCB material thicknesses can be +/- 10%, according to IPC-600A standards.

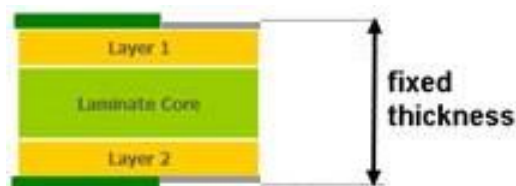


FIGURE 9: STACK-UP

## 7.2 Power limit

The operating current at 30°C T-Rise and at free airflow is about 45A. This value may be increased, if it complies with the maximum operating temperature of 105°C in all situations.

Depending on the application environment, the temperature rise can be limited by a forced air flow.

## 8. Environmental Requirements

### 8.1 Environmental

Operating temperature range = -40°C to 105°C

### 8.2 Shock & vibration

Refer to document "GS-12-1179" for shock and vibration requirements

### 8.3 Regulatory

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. PCB and components shall meet RoHS and UL94V-0 requirements.

## 9. Revision History

DATE	REVISION N°	DESCRIPTION
2019-02-11	0.1	Initial draft spec
2019-03-21	1.0	Final Version for Review and Approval