



Open Rack V3 IT Gear Design Guide

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Executive Summary

This document defines design guidelines for IT gear design for use in the ORv3 frame as part of the Open Compute Project. This document is a guideline and is not a hard requirement. All firm requirements are outlined in the Open Rack Base Frame V3 Specification. This guideline is intended for IT gear developers. Mechanical design information, assumptions, and special considerations are provided. Reference 3D CAD design files will also be provided in the contribution (attached in separate files).

Acknowledgements

The development of the document was a collaboration between Meta and Rittal. Rittal has been a partner in developing the Open Rack Version 3 Frame and specifications. Their expertise in frame design played a key part in the development of this IT gear design guideline. We would also like to thank the following for their contributions:

- Harsha Bojja - Meta
- Darryl Daniel - Meta
- Steve Mills - Meta
- Steven Moore - Rittal
- Dmitry Shapiro - Meta
- Sriram Srinivasan - Rittal

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Introduction

Design guide for IT gear used in the Open Rack ORv3 frame are provided below. The guidelines are based on the development work of the rack team for the ORv3 rack frame.

Revision Table

Date	Revision	Author	Description
10 AUG 2022	0.1	Glenn Charest	Initial Review with OCP Community
30 SEPT 2022	1.0	Glenn Charest	Final Submission with minor updates.

1 Mechanical

1.1 Design Guidelines

Below are the various design guidelines for the IT gear. As part of the release of the guideline, a step (.stp) format 3D CAD files are also provided in the zip folder.

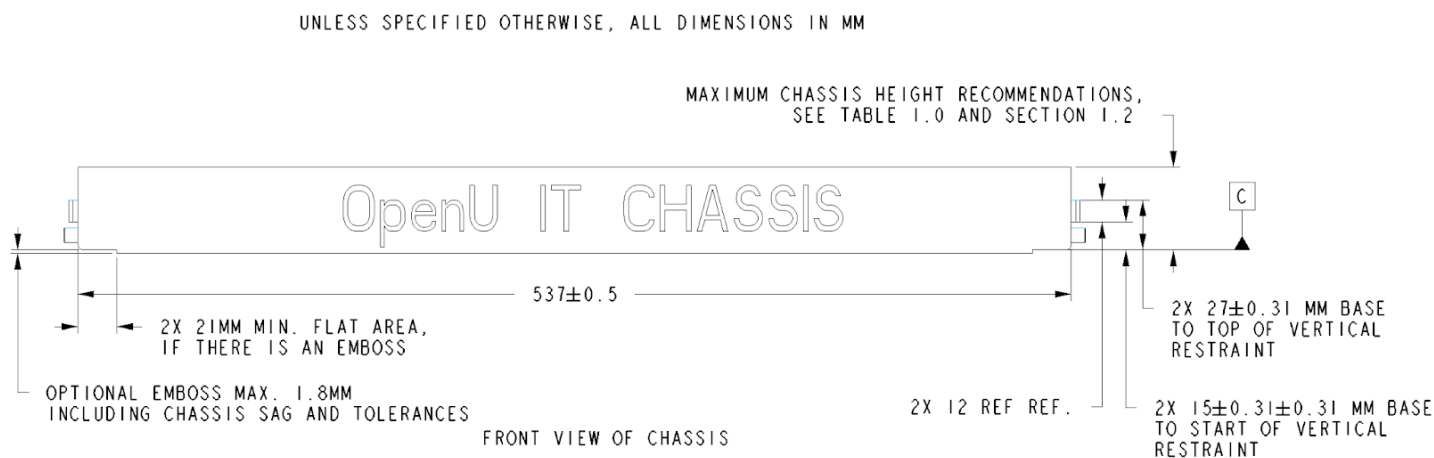


Figure 1

Table 1.0 ORv3 OpenU IT Gear Height Guidelines

Chassis Height Range	Recommended Height (mm)*
1 OpenU to 4 OpenU	48 X # OpenU - 3.3*
5 OpenU to 7 OpenU	48 X # OpenU - 3.4*
8 OpenU to 10 OpenU	48 X # OpenU - 3.5*
>10 OpenU	Developers will need to perform their own analysis to determine appropriate values.

*References Figure 1, also see Assumptions in Section 1.2

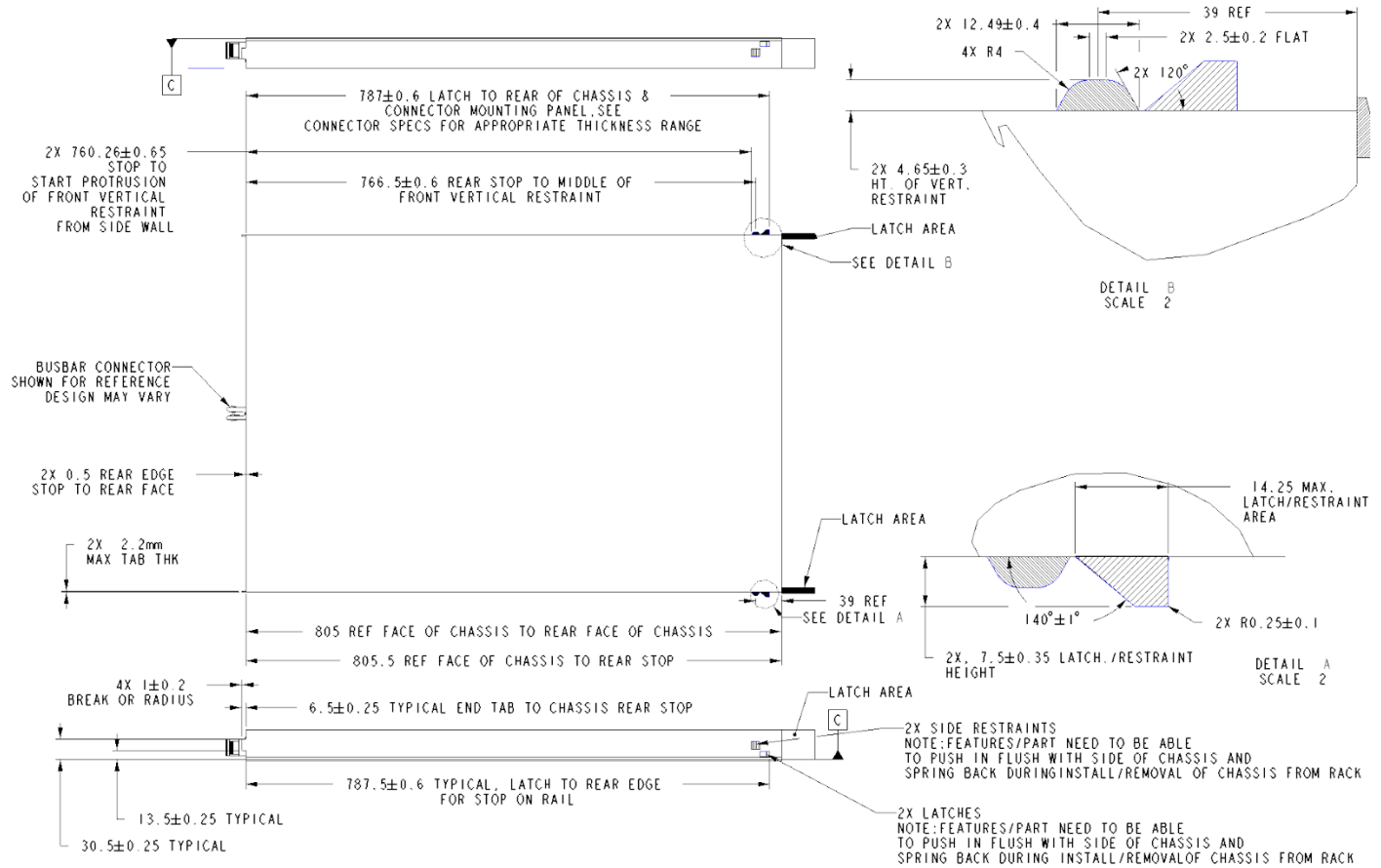


Figure 2

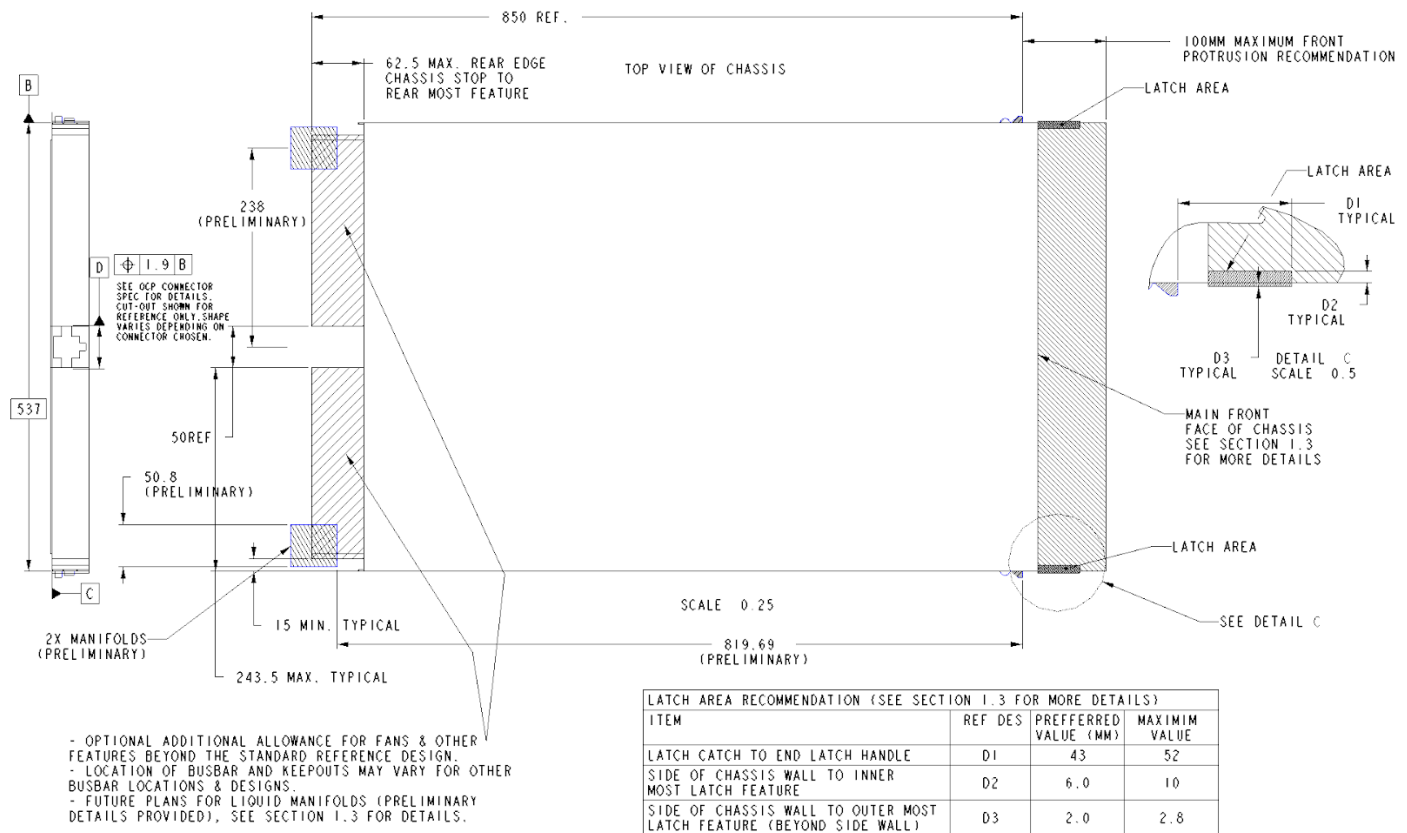


Figure 3

1.2 Assumptions:

The guidelines for chassis height in table 1.0 are based on the following assumptions:

1. Chassis weight is $\leq 80\text{kg}$ max
2. Weight is evenly distributed in chassis
3. End user is using standard hard tooling OpenU rack brackets with material properties, dimensions, tolerances, and features per the bracket drawings. The drawings for the brackets will be shared as part of the Meta ORv3 Frame specification
4. The front & rear vertical restraints are designed to constrain the chassis vertically during shipping and handling of a rack with the gear installed. The developer should design these features to be strong enough to restrain the IT gear during the developer's required shipping and handling tests. Heavier systems may require different features in the brackets and chassis from the standard brackets and guidelines outlined.

If the IT gear being developed has parameters outside of the above assumptions, the developer will need to perform analysis to determine if the height values and bracket design are adequate. If one deviates from the assumptions, some areas to be concerned about include weight and/or tolerance

differences resulting in the brackets or chassis violating the OpenU frame boundaries, yielding the standard OpenU brackets, and yielding the front and rear vertical restraints on the chassis.

1.3 Cabling Considerations:

There are both a recommended latch area and a front side protrusion area shown in Figure 4. These are general guidelines. Due to the fact that each rack cabling implementation differs, the developer should consider cable access & servicing requirements in designing their latch solution and front panel protrusions. Another consideration for this recommendation is service access for gear above or below this chassis where there are special access requirements.

1.4 Blind Mate Liquid Cooling Considerations:

OCP is developing blind mate liquid cooling solutions for ORv3. The development is in process and the final design is not complete. However, we have included the preliminary manifold size and location information as of this wiring to help the community. Figure 3 shows the preliminary manifold areas and should be considered if a system design plans to have components at the rear of the chassis & will be used in racks with blind mate liquid cooling. The design is subject to change and an update will be provided once the design is finalized.

1.5 Other form Factors:

OpenU power shelf and RU gear guidelines are not part of this document.

2 References

- [1] Open Rack Base Frame V3 Specification
- [2] The IT Gear bracket drawings - will be shared in the Meta Open Rack V3 Specification

3 License

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