SEMI G82-1115 (Reapproved 1220)
SPECIFICATION FOR 300 mm LOAD PORT FOR FRAME CASSETTES IN BACKEND PROCESS

This Standard was technically approved by the 3D Packaging and Integration Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on August 26, 2020. Available at www.semiviews.org and www.semi.org in December 2020; originally published March 2001; previously published November 2015.

1 Purpose

1.1 This Specification defines dimensional requirements for the load port of frame cassette for 300 mm wafer in backend process equipment. It is intended to promote a uniform physical interface between equipment and the factory, to facilitate the use of automated frame cassette transport systems, and/or to meet ergonomic requirements for manually loaded equipment.

2 Scope

2.1 This is a Standard covering equipment for 300 mm frame cassette only.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 This Standard is not intended for use in backend except frame cassette for 300 mm wafers. This Standard does not address direct loading/unloading of vacuum load locks. Requirements of such interfaces may differ from those in this Document.

4 Referenced Standards and Documents

4.1 *SEMI Standards and Safety Guidelines*

SEMI E15 — Specification for Tool Load Port

SEMI E15.1 — Specification for 300 mm Tool Load Port

SEMI E64 — Specification for 300 mm Cart to SEMI E15.1 Docking Interface Port

SEMI G77 — Specification for Frame Cassette for 300 mm Wafers

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

5 Terminology

5.1 Please see SEMI G77 for definitions of the following terms used in this Specification:

5.1.1 *bilateral datum plane*

5.1.2 *conveyor rails*

5.1.3 *facial datum plane*

5.1.4 *frame cassette*

5.1.5 *horizontal datum plane*

5.1.6 *tape frame*

5.2 Please see SEMI E15 for definitions of the following terms used in this Specification:

5.2.1 *load depth*

5.2.2 *load face plane*

Documents Document Sharing Hub

Full document details: SEMI G82-1115-1220R

5.2.3 *load height*

5.2.4 *load port*

5.2.5 *spacing*

5.2.6 *tool*

5.3 *frame cassette centroid* — a datum representing the theoretical location of the center of a stack of tape frames in the frame cassette.

6 Ordering Information

6.1 The following items require communication between the tool supplier and user and shall be included in any request for quotation or purchase order:

6.1.1 If the tool has multiple load ports, provide the spacing, S, between frame cassette centroids (see SEMI E15).

6.1.2 Specify what frame cassette (e.g., optional composition, see SEMI G77) is to be accommodated by the load port (see SEMI E15).

7 Requirements

7.1 The dimensional requirements for the load port are given in Table 1 with reference to the figures of this Document. Although the frame cassette transport systems shown in these figures appear similar to overhead monorails, they are intended to represent any type of transport system (AGV, PGV, conveyor, overhead track, etc.).

7.2 The dimensional requirements for the placement of the frame cassette on the load port are given in Table 1 with reference to the figures of this Document.

7.3 The tape frames are to be oriented horizontally at the time they are placed on the load port.

7.3.1 The frame cassette shall be loaded and unloaded with its front parallel to and away from the load face plane (see Figure 1).

7.4 Dimension H is nominally 900 mm, fully adjustable at installation over the range of 890 to 910 mm. The precision with which the load port height must be maintained is dictated by the needs of the frame cassette delivery system.

7.5 The load port must nominally be at 900 mm, and it must be open from above to facilitate automatic frame cassette delivery from an overhead transport system. The open volume required for vertical delivery is defined by a projection of the load port area, including the area required for C1 and C2 clearances, projected upward to the top of the tool. Note that this condition need only be met when the tool is being loaded. For example, the load port may be formed by a surface that extends outward during loading to provide overhead access.

7.6 As shown in Figure 2, the maximum allowable height of an obstruction on the load port over which the frame cassette must be lifted (before being set down on the kinematic couplings) is H1. Examples of such obstructions include alignment devices and identification tag readers as well as the kinematic couplings themselves. Below H1 above the horizontal datum plane, clearances C1 and C2 no longer apply.

7.6.1 Two exclusion volumes on the left and right side of the load port must also be kept clear so that fork lifts or conveyors may be used. Each exclusion volume extends from the load face plane to D0 beyond the facial datum plane and extends H0 below the horizontal datum plane between W1 and W2 from the bilateral datum plane.

7.6.2 The load port that advances the frame cassette from the undocked position (where the frame cassette is initially delivered to the load port) to the docked position (where the frame cassette is ready for frame extraction or insertion) must reserve an exclusion volume that is intended for (but not limited to) containing automated units that read or write to an ID tag on the rear of the frame cassette in the undocked position (where the frame cassette is initially delivered to the load port). If no reader/writer unit is installed, the exclusion volume may be covered by a panel.

NOTE 1: This section is incomplete and requirements will be added to the standard once the requirements and dimensions have been fully defined.

7.7 Clearances C1 and C2 are defined with respect to the maximum dimensions of the frame cassette (see SEMI G77). To prevent interference with overhead transport systems on the same or adjacent load port, it is recommended that

Documents
Document Sharing Hub

Full document details: SEMI G82-1115-1220R