

SEMI S9-0307 (Withdrawn 0211) GUIDE TO ELECTRICAL DESIGN VERIFICATION TESTS FOR SEMICONDUCTOR MANUFACTURING EQUIPMENT THAT HAVE BEEN MOVED TO SEMI S22

This Standard was technically approved by the global Environmental, Health & Safety Committee. This edition was approved for publication by the global Audits & Reviews Subcommittee on December 21, 2010. Available at www.semiviews.org and www.semi.org in February 2011; originally published in 1995; previously published March 2007.

NOTICE: Paragraphs entitled “NOTE” are not an official part of this document and are not intended to modify or supersede it.

1 Purpose

1.1 The purpose of this document is to provide a permanent withdrawal notice for SEMI S9 indicating that all technical content has been incorporated within SEMI S22.

NOTE 1: In the event that SEMI changes their document withdrawal process so that withdrawn document notices do not automatically disappear after two years, this document may be formally withdrawn.

1.2 A second purpose is to provide a brief history of the electrical design verification tests that have been documented in SEMI Standards and used in the industry.

2 Scope

2.1 The scope of this document is all of the electrical design verification tests that were previously included in SEMI S9 (1101 revision) and incorporated into the SEMI S22 document.

2.2 The following tests have been transferred to the SEMI S22 document (section references are to SEMI S22):

- Leakage Current Test for Cord and Plug Equipment (§ 22.2)
- Earthing Continuity and Continuity of the Protective Bonding Circuit Test (§ 22.3)
- Starting Current Test (§ 22.4)
- Input Test (§ 22.5)
- Dielectric Test (§ 22.6)
- Strain Relief Test (§ 22.7)
- Transformer Output Short Circuit Test (§ 22.8)
- Power Supply Output Short Circuit Test (§ 22.9)
- Safety Circuit Function Test (§ 22.10)
- Safety Circuits Conductor Disconnection Test (§ 22.11)
- Capacitor Stored Energy Discharge Test (§ 22.12)
- Temperature Test (§ 22.13)

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 Referenced Standards and Documents

3.1 SEMI Safety Guidelines

SEMI S1 — Safety Guideline for Equipment Safety Labels

SEMI S2 — Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment

SEMI S22 — Safety Guideline for the Electrical Design of Semiconductor Manufacturing Equipment

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

4 Test History

4.1 Electrical tests were first documented in SEMI S9-95 with the following list of tests (section citations are to SEMI S9-95):

- Starting Current Test (§ 9.1)
- Input Test (§ 9.2)
- Dielectric Test (§ 9.3) 1000V + twice operating V
- Leakage Current Test (§ 9.4)
- Grounding Continuity Test (§ 9.5)
- Strain Relief Test (§ 9.6)
- Transformer Output Short Circuit Test (§ 9.7)
- Power Supply/Controller Output Short Circuit Test (§ 9.8)
- Safety Circuit Function Test (§ 9.9)
- Connector /Lead Disconnect Test (§ 9.10)
- Capacitor Stored Energy Discharge Test (§ 9.11)
- Temperature Test (§ 9.12)

4.2 In the 1101 revision of this document, the tests were re-ordered and the following changes to the criteria were made:

4.2.1 *Input Test* — Sensitivity of current or power measuring equipment was decreased from 1% to 3%.

4.2.2 *Dielectric Withstand Test* — The following changes were made to this test:

- Test equipment description changed significantly.
- Test voltage was changed from 1000V + twice the operating voltage for AC and DC voltage of 1.414 times the AC voltage to the fixed test voltages of 1500VAC and 2121VDC.
- Added test condition to test at maximum operating temperature.

4.2.3 *Leakage Current Test* — Was renamed to Leakage Current Test for Cord-and-Plug Equipment.

4.2.4 *Ground Continuity Test* — Changes include:

- Change test equipment sensitivity from 0.01–0.10 Ohm.
- Added exception to not require test if accessible metal surfaces are not likely to be come energized in a single fault condition.

4.2.5 *Transformer Output Short Circuit Test* — A second exception to the test was added for thermally-protected or impedance-protected transformers that are certified by an accredited test lab.

4.2.6 *Power Supply/Controller Output Short Circuit Test* — Renamed to Power Supply Output Short Circuit Test with the following changes:

- Re-scoped to not include controllers.
- Added acceptable result of 8 hours without a hazardous condition (e.g., smoke, fire or molten material).

4.2.7 *Safety Circuit Function Test* — The following acceptable results criteria were added: