

Voltage dips and semiconductor tools: Practical experience with SEMI F47 and IEC Standards

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- Power Standards Lab
- Chair of IEC 61000-4-30 TF2, also IEC 61000-4-11, 61000-4-36, IEEE
- North America, Asia, Europe, Africa
- Has tested and certified more than 200 tools
- The “world’s leading expert” on electric power and semi processing



Andreas Eberhard

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- Power Standards Lab (California)
- Almost 15 years of experience in product compliance based on international standards and requirements (around the world)
- Member of various SEMI standard committees
- Has tested and certified more than
- 300 different tools and products for
- Voltage Sag Immunity (SEMI, CE, IEC)
- The other “world’s leading expert” on ag immunity and semi processing
- Lived in wonderful country Japan from 1995-1999



Chuck Thomas

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- EPRI
- Senior Engineer, Semiconductor and Industrial power quality group
- Conducted hundreds of Semiconductor and Industrial Power Quality Tests and Audits
- United States, Asia, and Europe
- Semiconductor and Industrial power quality group
- Key in developing EPRI Solutions' SEMI F47 compliance test methodology
- Analyzed over 135 tool designs for PQ immunity.
- One of the world's leading experts



Mark Stephens

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- EPRI
- Engineering Manager, Semiconductor and Industrial power quality group
- 19 Years Experience in Industrial Controls and Power Quality
- Leading authority on effect of voltage sags on industrial equipment.
- Pioneering Expert on SEMI F47 and effects of voltage sags on Semiconductor Tools
- Secretary of Joint Working Group JWG C4.110 "Voltage Dip Immunity of Equipment Used in Installations".
- Key in development of original SEMI F47 and SEMI F42 as well as revised SEMI F47-0706
- United States, Asia, and Europe
- Professional Engineer



Standards Technical Educational Program on Voltage Dips and Semiconductor Tools: Practical Experience with SEMI F47 (Equipment Voltage Sag Immunity) and IEC Standards

Introduction: Voltage dips on the AC mains disrupt and damage semiconductor tools. Most FABS worldwide now refuse to accept 300mm tools that are not certified to survive voltage dips. And tool manufacturers push this requirement down the chain to their sub-system and components vendors. The new SEMI F47-0706 standard sets requirements for how equipment must tolerate voltage sags on the AC power line, and is similar to IEC 61000-4-11 and the new IEC 61000-4-34 standards. This half-day STEP (Standards Technical Education Program) will review the practical experience with this standard, Hands-on experience by test houses, sub-system suppliers, tool manufacturers, and semiconductor FABS will be presented.



1. (Alex) How semiconductor tools respond to AC mains disturbances
2. (Mark) Practical AC mains in semiconductor FABs – how they differ from ideal AC mains, and what disturbances can be expected
3. (Alex) IEC and CE standards and SEMI F47-0706 - differences, overlaps, similarities
4. (Chuck) Overview of SEMI F47-0706
5. (Andreas) Tool Vendors and Sub Component Supplier Perspectives, including some zero-cost or low-cost solutions
6. (Mark) Pre and Post SEMI F47 Compliance Issues
7. (Chuck and Andreas) How to get started – some practical, hands-on advice.



STEP Schedule

9:30-9:35	Introduction
9:35-10:10	How semiconductor tools respond to AC Mains disturbances
10:10-10:40	Practical AC Mains in semiconductor Fabs
10:40-11:10	Sag Immunity requirements around the world (SEMI, IEC, CE)
11:10-11:40	Overview of new SEMI F47-0706 revision
11:40-11:50	Break
11:50-12:20	Low-cost solutions for tool and component vendors
12:20-12:50	Pre and Post SEMI F47 compliance issues
12:50-13:20	How to get started – some practical hands-on advice
13:20-13:30	Questions and Answers

