

KGD STANDARDS

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Who's Developing KGD Standards?

United States

- Electronic Industries Association (EIA)
- SEMATECH
- IC Delco

Europe

CENELEC Electronic ComponentsCommittee (CECC)

EIA-JEDEC JC-13 Committee

EIA/JESD49 Procurement Standard for Known Good Die (KGD) (Pub. Feb. 1996)

- Developed by Task Group JC-13 9104 (Chair: Barrett/Hornback)
- Scope: Provides procurement guidelines and requirements for KGD used in other than conventionally packaged microcircuit or discrete formats....intended to be high quality, reliable bare dice for use in a variety of user-defined applications.



Limited to KGD consisting of a single microcircuit or discrete device connected using conventional wire bonding or high density interconnect.

Issues:

- Standard burn-in and test scenarios lacking but would greatly enhance document if included or referenced
- Standard handling guidelines needed to protect hardware until integrated into final assembly
- Doesn't deal with non-standard/exotic technologies

Benefits:

- Outlines standard information that die manufacturers may be asked to provide for applications that use KGD.
- Allows supplier/customer negotiation of requirements with the expectation that KGD product will have as-delivered performance, quality and long term reliability that are at least as good if not better than packaged versions.



EIA/JESD XX "Guidelines for the Safe Handling of Bare Die and Wafers, including Known Good Die (KGD)"

- Task Group JC-13 9501 (Chair: L. Hornback)
 - Working with SEMATECH and IC Delco
 - Approved by JEDEC-in coordination to JEDEC Council for publication
- SCOPE: Recommended safe practices for safe physical and environmental handling of bare wafers and die.
- Issues: Does not deal with non-standard/exotic technologies directly.
- Benefits: Provides manufacturers, die processors and end users with standard guidelines for physical handling, cleaning, packaging, documenting and preservation of wafer and die product.



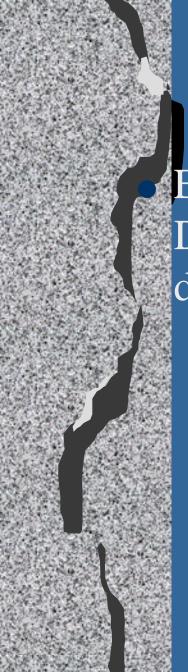
SEMATECH

Low Cost KGD PTAB/Low Cost Shipping Medium Task Force

- Working on four specific areas:
 - Standard for die orientation in Gel Pak® & Waffle Pack to facilitate die product automated manufacturing
 - Standard for packaging and labeling
 - Standardized Gel Pak® dimensions and tolerances
 - Standardized Waffle Pack dimensions and tolerances

• Issues:

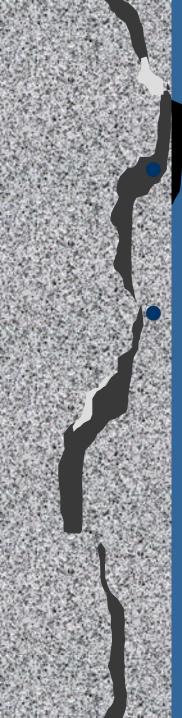
- SEMATECH publications typically limited to member companies
- End-users and die processors not directly represented



IC DELCO

Engineering Response Team developing
Delco version of handling guideline for bare
die and wafers

- Working with JC-13 9501 to incorporate their work into JEDEC standard for handling
- Incorporating all of the JC-13 9501 document
- Adds Delco detailed information where the JEDEC standard is too general
- Not supported by mainstream industry except through JC-13 task group

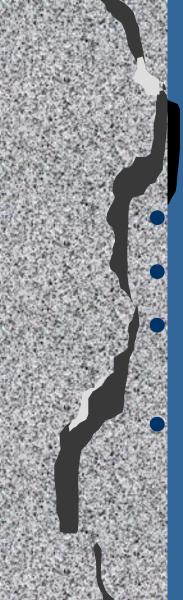


CECC

Developing European specifications for KGD titled "Data Requirements for Semiconductor Die (KGD)"

CECC working group members include ESPRIT GOOD-DIE project, EECA, Sematech, EIAJ...

- ESPRIT GOOD-DIE Project to develop a database for the selection of un-packaged and minimally packaged semiconductor die & for downloading of design data for MCM & Hybrid circuits
- EECA European Electronic Component Manufacturers
 Association
- SEMATECH Semiconductor manufacturers consortium
- EIAJ EIA Japan



Data Requirements for Semiconductor Die (KGD)

- Part 1 General Requirements (draft '97)
- Part 2 Vocabulary (draft '97)
- Part 3 Mechanical, material and connectivity requirements (proposed)
- Part 4 Specific Requirements (proposed)
 - 4.1 Test & Quality
 - 4.2 Handling
 - 4.3 Thermal
 - 4.4 Electrical simulation



Part 5 - Particular requirements for die types (proposed)

- -5.1 Bare die
- -5.2 Die with connection structures
- 5.3 Minimally-packaged die
- Part 6 Exchange data formats and data dictionary (proposed)



Data Requirements for Semiconductor Die (KGD) Part 1-General Requirements

Includes very general product identity, product performance, thermal & mechanical data and information related to die mechanical, test, quality & reliability, handling, storage and mounting guidelines.

Specifies the need to exchange pertinent data between manufacturers and end-users

References a number of IEC, ISO, EIA, IEEE, FED-STD-209, and MIL documents



Data Requirements for Semiconductor Die (KGD) Part 2- Vocabulary

Vocabulary and definitions in following categories;

- Organizations & Standards
- General Terminology
- General Terminology (Test)
- General Semiconductor Terminology
- Design & Simulation Terminology
- Electronic Technology Terminology
- Packaging Terminology
- Packaging & Delivery Terminology



KGD Standards have a long way to go toward supporting availability of "standard" KGD products

- EIA leading standards efforts to date
- European standard could be very useful if they are successful at putting "meat" into test and quality requirements
 - Truly "standard" KGD not likely due to manufacturer unique & protected evaluation methods