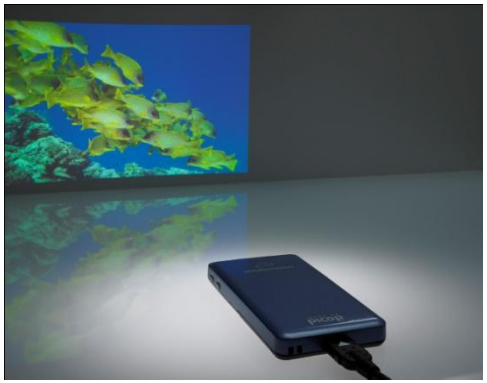
MEMS Industry Group

Presents

Integration vs. Disintegration from a Design for Manufacturing and Test Perspective



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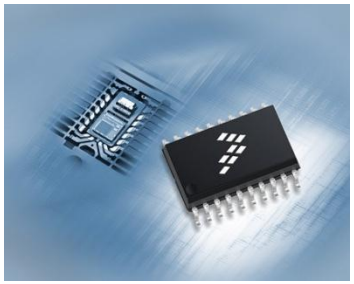

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MEMS Manufacturing Trends

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- **High-volume manufacturing is a key component to growth:**
  - However, there are still high-value, specialized MEMS (industrial, defense)
  - MEMS originally designed and vetted for automotive applications now repurposed for consumer electronics
  - Supported by fabs getting more adept at MEMS manufacturing & integration
  - Marks new era in consumer understanding and acceptance of MEMS
  - There have been great changes in MEMS – we'll likely see more consolidation and partnership in the next five years…
- **Cost is critical factor BUT:**
  - With increase in technology and algorithms enabled by MEMS, we'll see more "system sell" – see Apple iPhone and proliferation of apps enabled by MEMS
  - We'll see more on-chip integration, CMOS, TSV and other fabrication techniques to enhance functionality AND reduce costs

Integration – Key Themes and Trends

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METRIC

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- **Driving Forces of Integration**
  - Easier to integrate than ever, MEMS gaining reputation as an enabling technology
  - Cost, performance and function – don't have to pick two
  - It's all about selling the solution – MEMS
- **Packaging Trends**
  - I've seen the future and it's WLP with TSV
  - Integration is an application specific issue – monolithic integration may make sense for TI's DLP but not for a MEMS microphone…
  - IP is an issue – note recent MEMS company acquisitions
- **Fabrication Challenges and Opportunities**
  - Rising use of CMOS and CMOS integration for MEMS companies (rise of fabless and successfully fabless)
  - Timeline for MEMS fabrication shrinking (months vs. years) – but funders still need to better educated on cost/time considerations
  - The "S word" (standards) – special sauce vs. standardization – where to start? MEMS testing standards…

MEMS Industry Group (MIG)

- MIG is THE trade association **advancing MEMS across global markets.**

- With nearly 90 **member companies from around the world** – from start-ups to Fortune 500 companies, MIG members represent the entire MEMS supply chain:
  - Device manufacturers, equipment suppliers, materials suppliers, foundries, software vendors, association partners, market analysts…

- MIG offers a wide range of programs for everyone in your company -- from the top executive to the new hire:
  - METRIC, MEMS Education Series
  - MEMS Executive Congress
  - MEMS Marketplace, MEMS Glossary
  - MEMS Webinars and online meetings
  - Information-sharing and dissemination through blogs, Twitter, LinkedIn groups, and newsletters
  - Speaking opportunities at Globalpress Electronics Summit, Microtech Conference & Expo, SEMICON West, and more…

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