

SIXTEENTH ANNUAL

BiTS

TM

Burn-in & Test Strategies Workshop

March 15 - 18, 2015

Hilton Phoenix / Mesa Hotel
Mesa, Arizona



Archive – Session 7

Session 7

Valts Treibergs
Session Chair

BiTS Workshop 2015 Schedule

Solutions Day

Wednesday March 18 8:00 am

All That Glitters Is Or Is Not Gold

"One piece spring probes in one piece house socket (The best cost socket solution)"

AJ Park & JD Cho - IWIN Co. Ltd.

"MEMS rubber contact for TEST socket"

Justin Yun & BoHyun Kim - TSE Co., Ltd.

Do You Believe In Leprechauns?

"Marketplace Report"

Ira Feldman - Feldman Engineering Corp.

"A Testing Time for Test Socket Suppliers"

John West - VLSI Research

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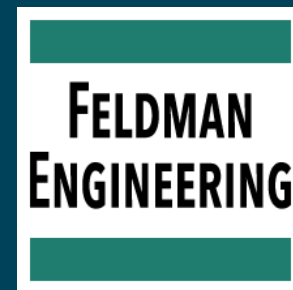


Marketplace Report

Ira Feldman
Feldman Engineering Corp.



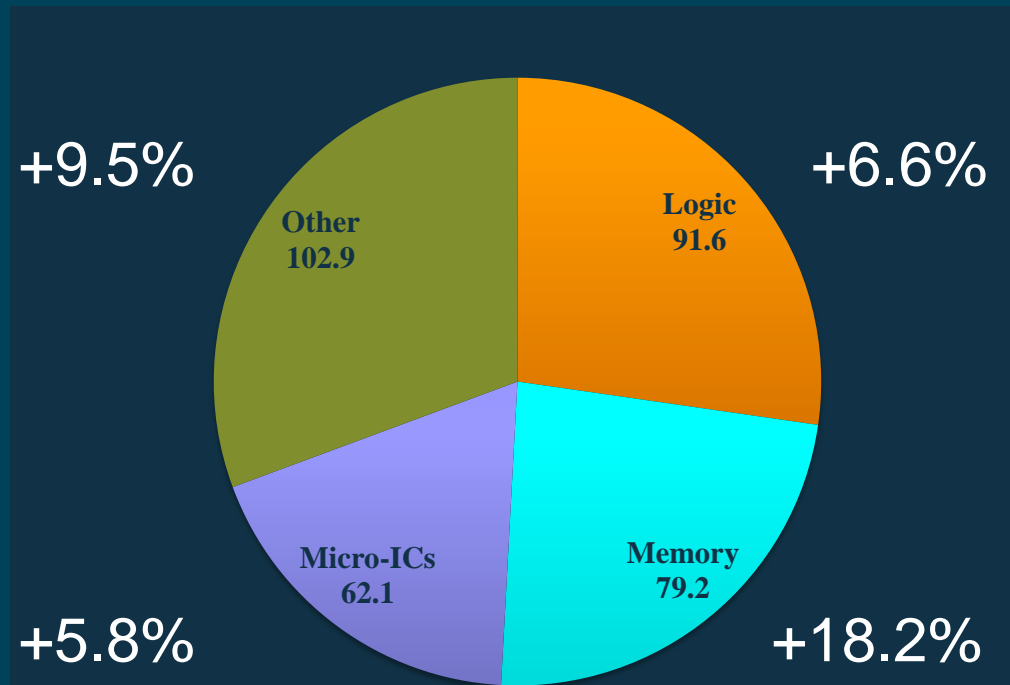
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Acknowledgements

- Data from various sources with attribution
- Test Socket and Contactor Data Provided by Fleck Research
 - “Analysis of Test Sockets and Contacts and ATE Market”, 2014 report, R-2007/14
 - Market data is as of 2013
 - 5th Annual Presentation at BiTS
 - Highlights only – more is available in the report
- Fred Taber – Taber Consulting
- Deb Ahlgren – Feldman Engineering

Semiconductor Sales 2014 (US\$ B) by Product Type



Record \$335.8B +9.9% YoY

Source: SIA, Feb. & Mar. 2015

Socket Marketplace Report

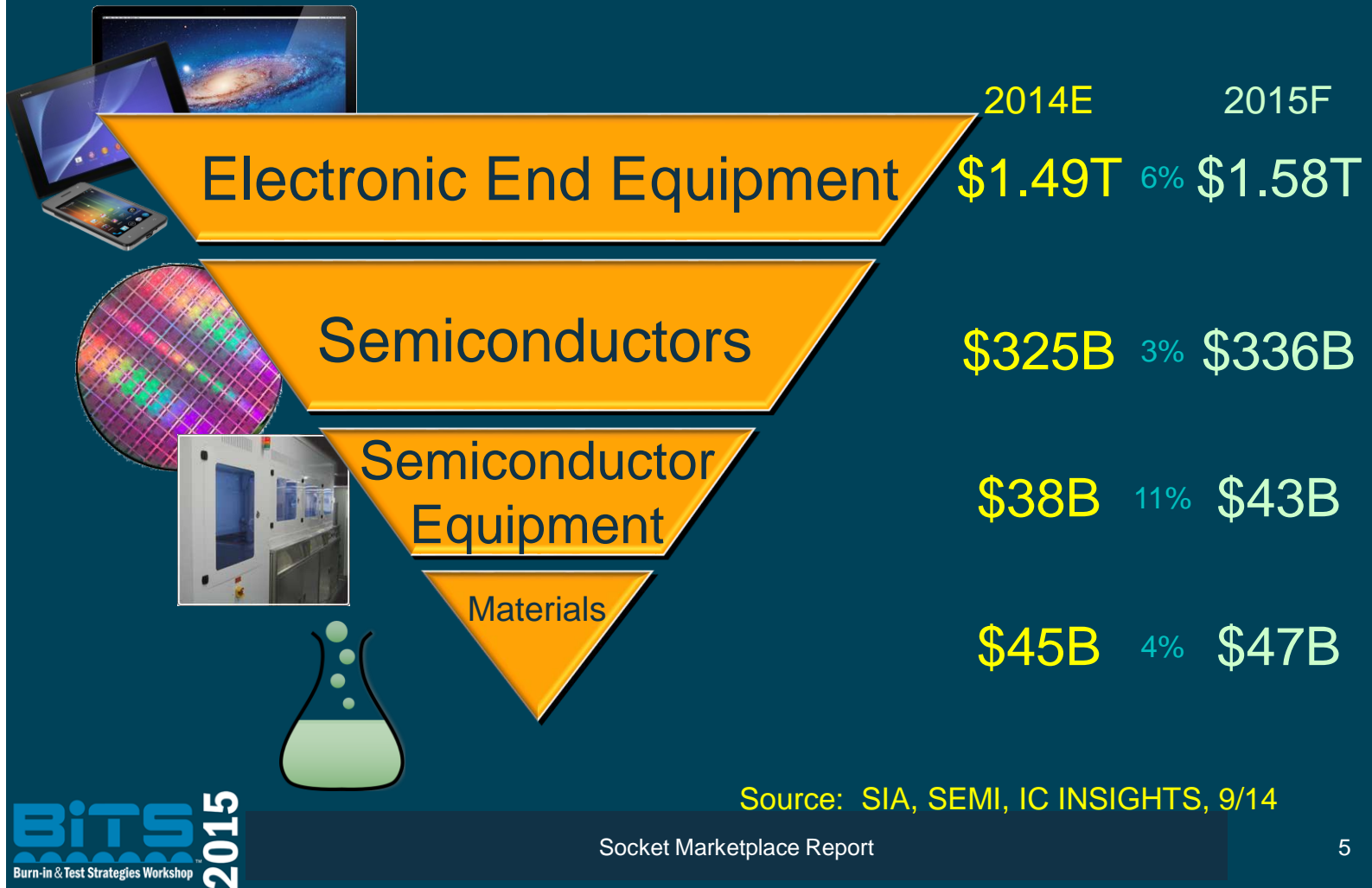
Automotive Semiconductors

\$29B +10% YOY

Supplier	Rank		Market Share (%)		Key Drivers
	2014	2013	2014	2013	
Infineon	1	2	9.8	9.2	Strong growth in Chassis & Safety, Powertrain & Body & Convenience Infineon's power management solution benefits from HEV/EVs Market
Freescale	4	4	7.4	7	Distinctive presence in fast growing segments such as Infotainment, ADAS, and HEV/EVs
Texas Instruments	5	7	6.4	5.3	Strong year for TI's embedded processors, especially in ADAS and Infotainment
On Semiconductors	8	8	3.6	2.9	Increased position in ADAS with acquisition of Aptina's CMOS imaging sensors
Micron	9	13	2.5	1.8	Increased its share in memory ICs for Infotainment with its DRAM and eMMC solutions

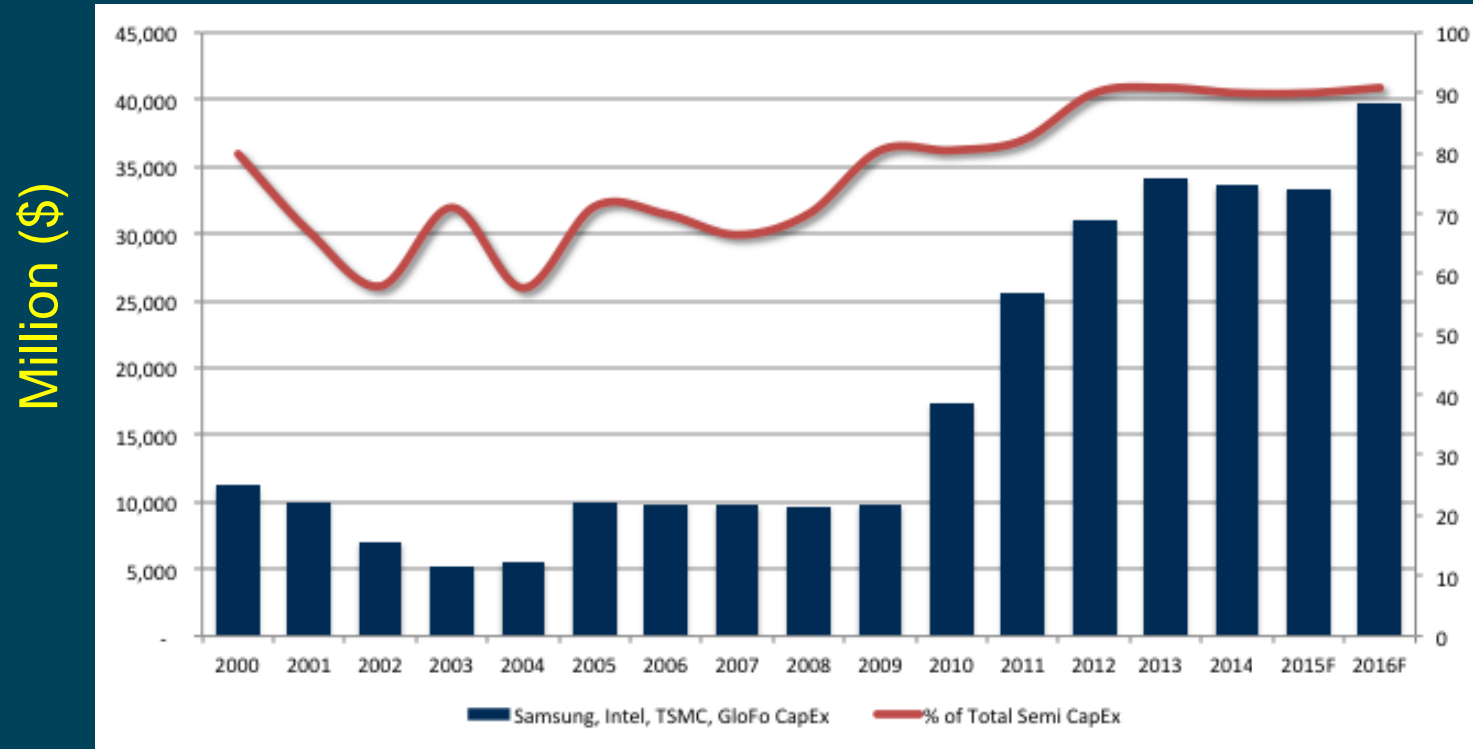
BiTS 2015

The Electronics Ecosystem



CapEx Concentration

Samsung, TSMC, Intel, GlobalFoundries



Source: Gartner, 9/14 and Company Data

The Way Forward

In 2015:

- Semiconductor sales will post a 5.4% increase
- Semiconductor capital spending will increase by 0.8%
 - Semi CapEx to grow 5.6%
- Shipments of PCs, tablets, ultramobiles and mobile phones for 2015 are estimated to reach 2.5 billion units, an increase of 3.9 percent over 2014
- There will be 4.9 billion “connected things”

By 2020:

- 250M connected vehicles will be on the roads
- M2M “things” will reach 25 billion

Source: Gartner: Jan, Feb. & Mar. 2015

The Way Forward



Image Credit: Logicbay.com

Fleck's Definitions

Production Sockets

- Enable the chip to be inserted and removed from the motherboard.

Burn-In Sockets

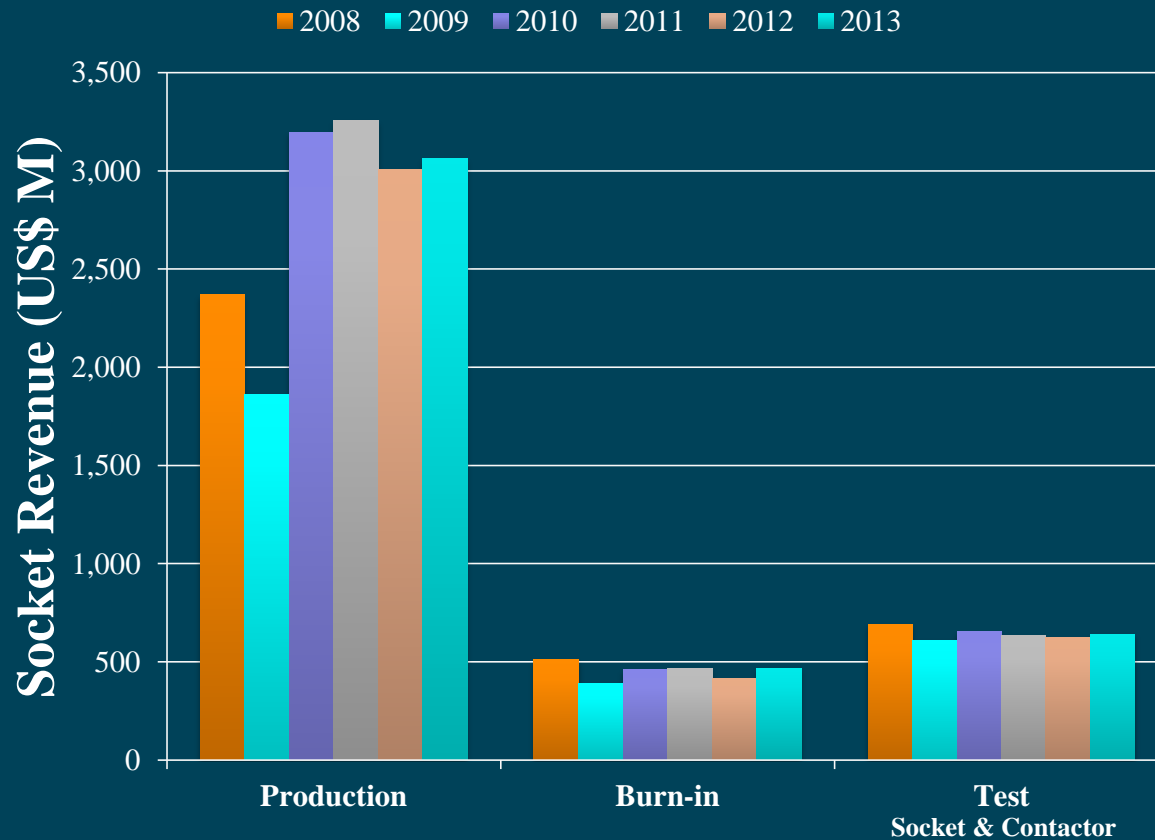
- Facilitate the exercising of the chip at higher than normal voltage and temperature; Burn-in sockets do not utilize spring probes. The contacts are stamped and formed.

Test Sockets & Contactors

- The interface between a device under test (DUT) and a test system. Typically rests on a load board that can be interchanged with similar boards

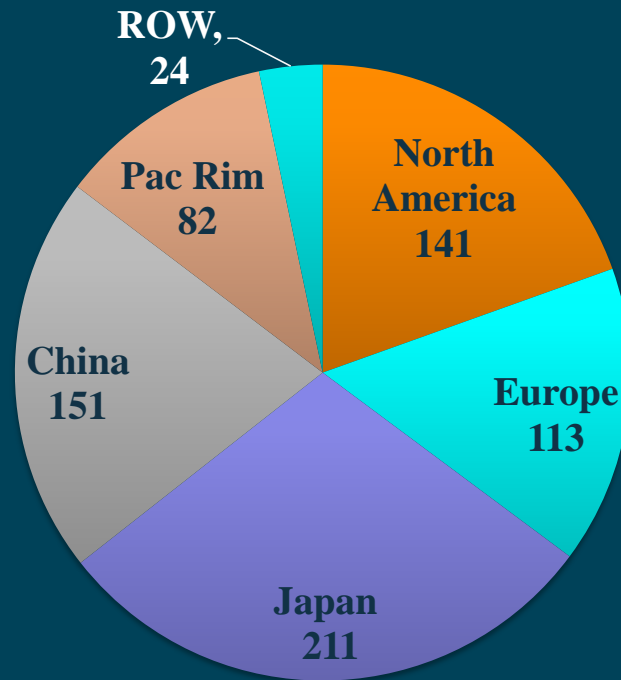
Source: "Analysis of Test Sockets and Contacts and ATE Market", 2014
Fleck Research, Global Connector Research Group, Inc., R-2007/14

Global Socket Revenue by Type



Source: Fleck Research, 2014

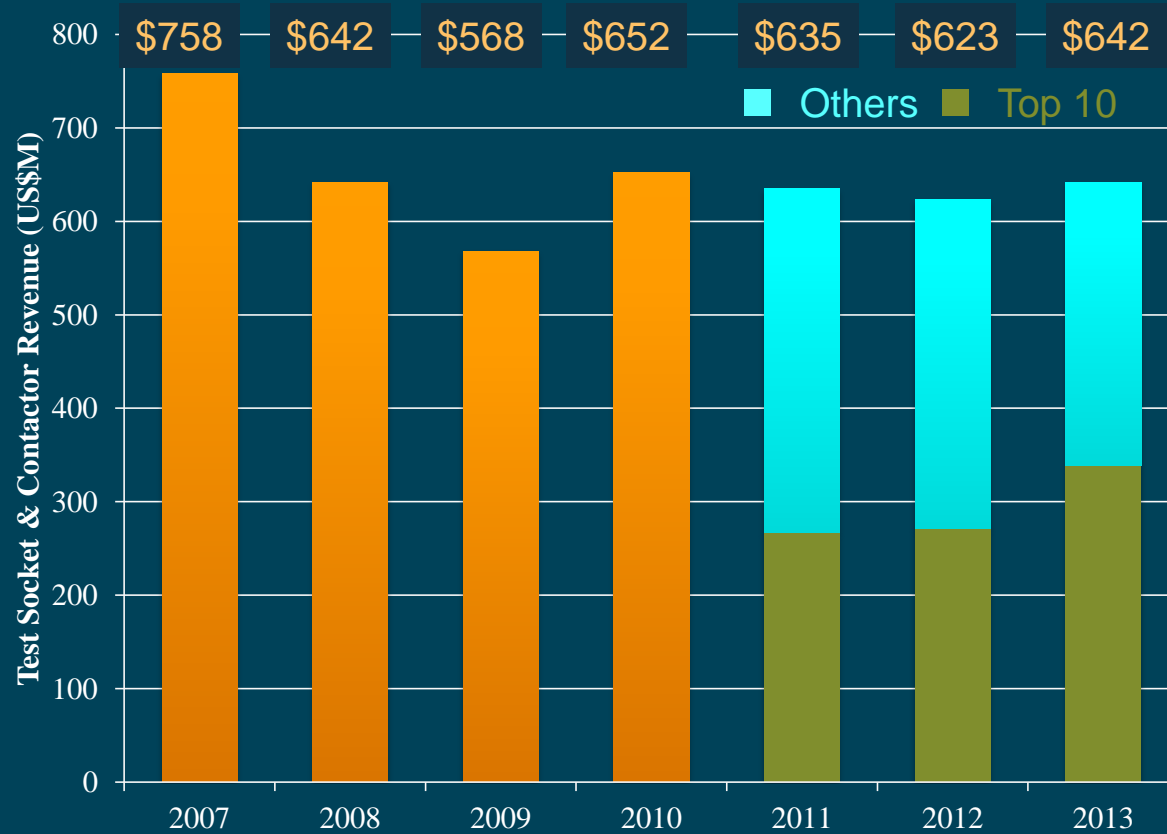
Test Socket & Contactor Revenue (US\$ M) by Geography



Totals will not sum due to double-counting

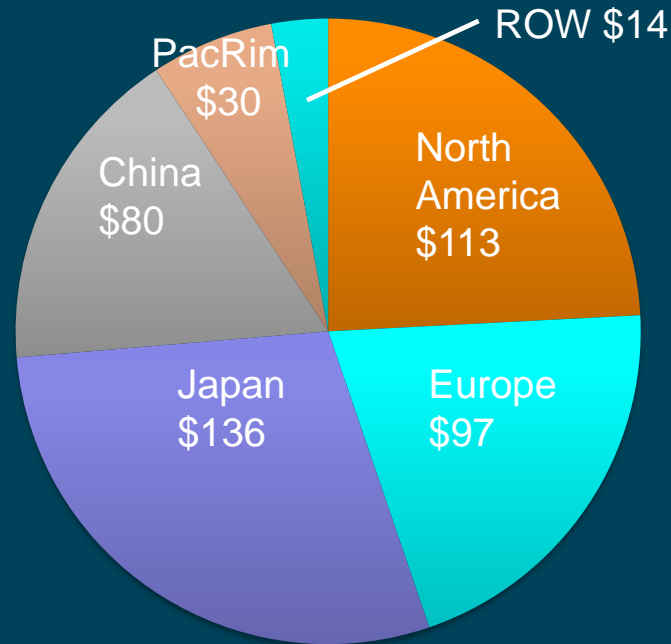
Source: Fleck Research, 2014

Supplier Concentration Increasing



Source: Fleck Research, 2014

Burn-In Contactor Revenue (US\$ M) by Geography



Totals will not sum due to double-counting

Source: Fleck Research, 2014

Conclusions

- Reasonable growth forecasted to 2018
- Test Socket & Contactor market evolving
 - “Roll ups” creating greater concentration
 - Previously dominant companies challenged
 - Technical challenges, especially for high speed, increasing rapidly
- Burn-in Contactor
 - One dominant contactor company