

# FPCA Technology Roadmap

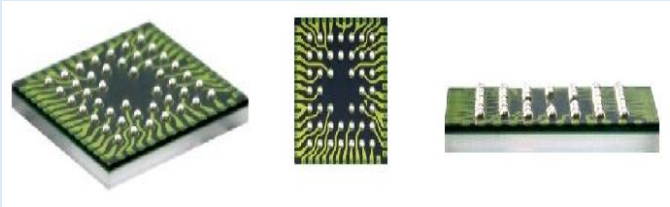
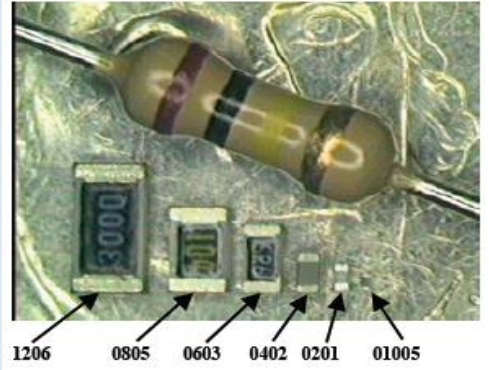
## Mass Production

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**Min BGA Pitch: 0.5mm**  
**Min SMT Size : 0201**  
**ACF Attach Pitch: 100μm**

**Min BGA Pitch: 0.4mm**  
**Min SMT Size : 01005**  
**ACF Attach Pitch: 85μm**

**Min BGA Pitch: 0.3mm**  
**Min SMT Size : 01005**  
**ACF Attach Pitch: 70μm**



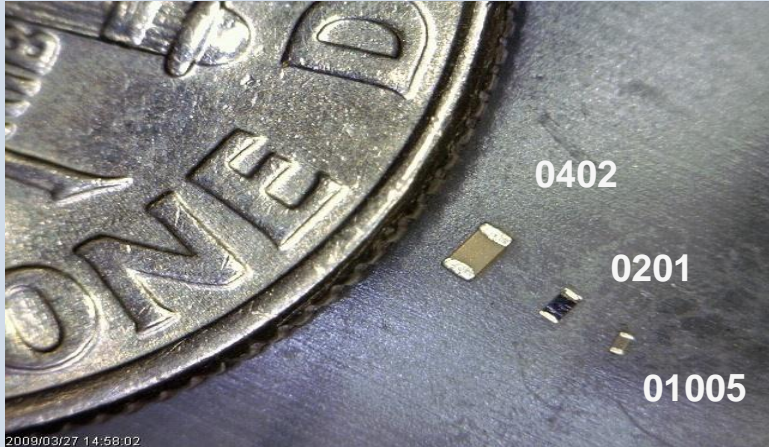
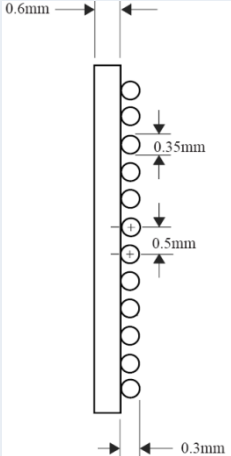
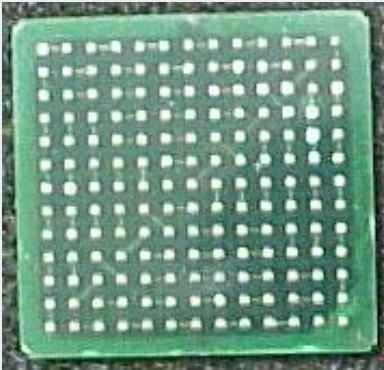
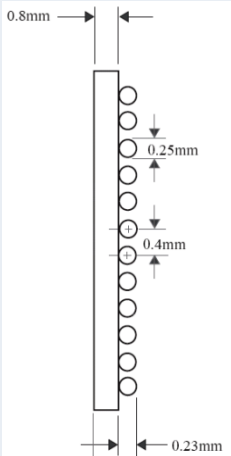

**2010 (1H)**  
 Location: MFC1, MFC2

**2010 (2H)**  
 Location: MFC1, MFC2

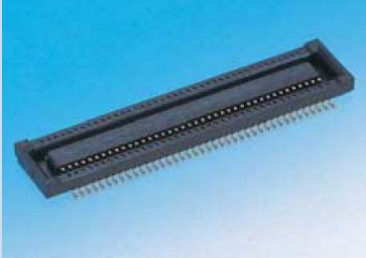
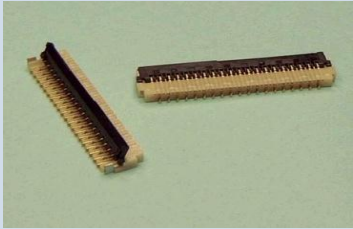
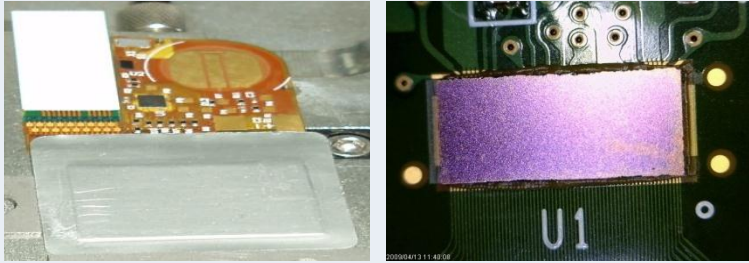
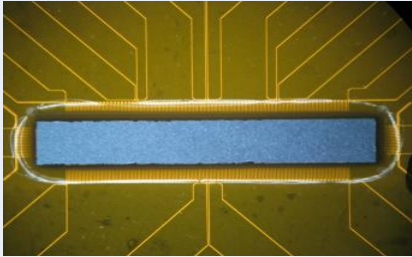
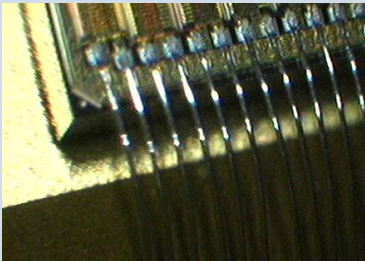

**2011**  
 Location: Chengdu, MFC1, MFC2

- Workcell and line configurations development
- PSA materials precutting and automated placement
- Automated stiffener attachment
- Robotic material handling for non-value added movements
- Machine vision for manual inspection replacement
- Real time process metrology tools integration
- Circuit bend/form tools handling and control integration
- Automated assembly handling for Test Handler automation and line integration between value-added processes
- QCD rapid tool change initiative

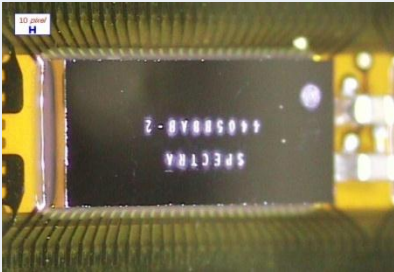

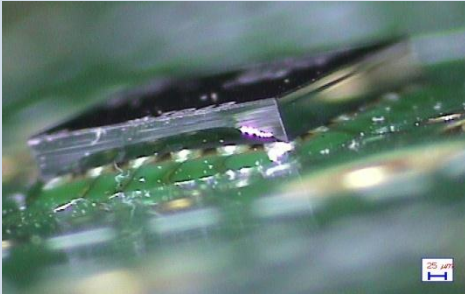
# FPCA Capability and Technology Development

Process	Mass Production	Development
<p align="center"><b>Chip Component</b></p>	<p>0402 &amp; 0201 chip component</p>  <p align="right">0402 0201 01005</p> <p><small>2009/03/27 14:58:02</small></p>	<p>01005 chip component</p>
<p align="center"><b>BGA / CSP</b></p>	  <p align="center"><b>0.5mm BGA</b></p>	  <p align="center"><b>0.4mm μBGA</b></p>

# FPCA Capability and Technology Development

Process	Mass Production	Development
<p><b>Connector</b></p>	<p>0.4mm pitch</p> 	<p>0.3mm pitch</p> 
<p><b>ACF / ACA / ACP Attachment</b></p>	<p>COF -100um pitch</p> 	<p>COF -70um pitch</p> 
<p><b>Au Ball / Al Wedge wire bonding</b></p>	<p>85um pitch</p> 	<p>75 um pitch</p> 

# FPCA Capability and Technology Development (Cont.)

Process	Mass Production
<p><b>Selective / Laser Soldering</b></p>	<ul style="list-style-type: none"> <li>• Solder paste dispense laser soldering</li> <li>• Solder wire feed laser soldering</li> <li>• Piezo to Flex attachment</li> </ul>
<p><b>No-Flow Encapsulant</b></p>	<div style="display: flex; justify-content: space-around;">   </div>
	

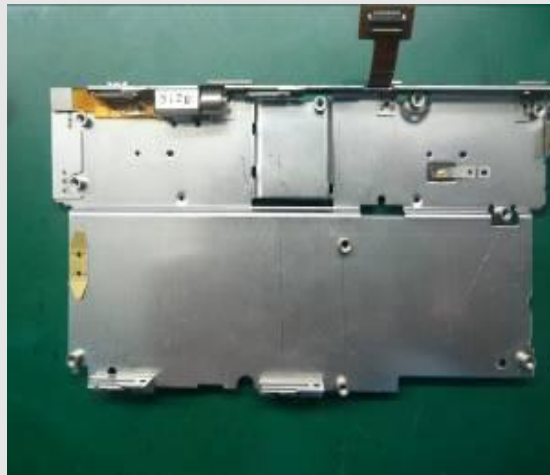
# 2010 FPCA Technology Capabilities

Features / Processes / Products	Mass Production	Limited Production	Development
<b>SMT Components</b>			
• QFP, QFN, CSP, SOP, BGA, LCC, CLCC, etc. (min pitch)	0.5mm	0.4mm	0.4mm
• FPBGA, QSOP, Flip Chip, etc. - Reflow Encapsulant (min pitch)	0.4mm	0.4mm	0.3mm
• Smallest Chip Component Size (capability - EIA/METRIC)	0201/0603	0201/0603	01005/0402
• Flip Chip & BGA Under fill (capability)	Positive Disp./ Auger	Auger/Jetting	Jetting
<b>ACF/ACA Attachment</b>			
• Flip Chip - Peripheral or Array Bumps (min pitch)	100µm	85µm	70 µm
• EL Panel assembly	EL Panel to Flex	EL Panel to Flex	Flex to Display
<b>Direct Chip Attach (DCA) to Flex</b>			
• Gold Ball Bonding	150µm	75µm	75µm
• Aluminum Wire Bonding (capability)	150µm	85µm	75µm
<b>Solder Types</b>			
• SAC Alloy –Pb Free Solder - Aqueous & No-Clean (capability)	Type 4	Type 4	Type 4 (HF)

# 2010 FPCA Technology Capabilities (Cont.)

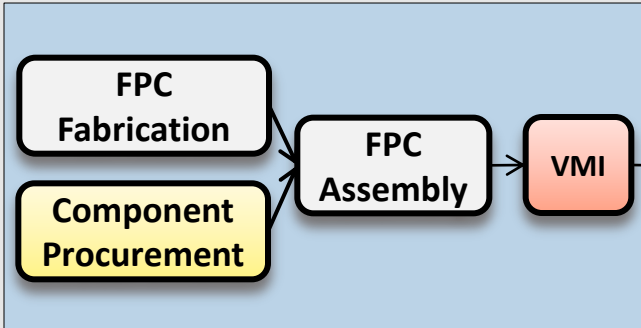
Features / Processes / Products	Mass Production	Limited Production	Development
<b>Selective / Laser soldering (capability)</b>			
• Piezo Electric component to flex soldering	Laser Soldering	Laser Soldering	Induction Soldering
• Spot Welding	Component to Chassis & Chassis to Chassis	Other applications	Other applications
<b>Higher Level Mechanical Assembly</b>			
• Flex to Chassis Integration	Stainless Steel, Magnesium, Plastic	Other applications	Decorated Parts
<b>Post Reflow</b>			
Hot Bar soldering (min pitch)	0.5mm	0.5mm	0.4mm
<b>In Process Inspection</b>			
• Solder paste inspection (SPI)	0201 & larger	0201 & larger	01005 & larger
• Automated Optical Inspection (AOI)	0201 & larger	0201 & larger	01005 & larger

## Module Integration (Level 3)

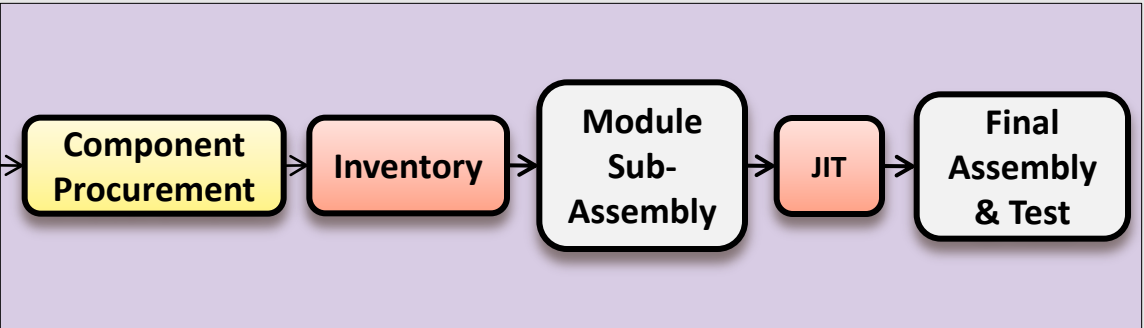


# MFLEX Supply Chain Compression Solution

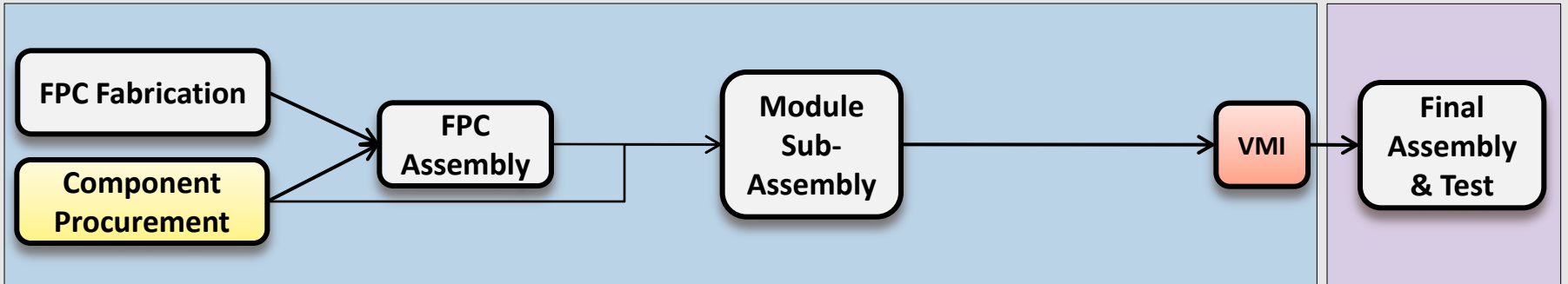
## Typical FPC/FPCA Supplier



## Typical OEM/EMS Company

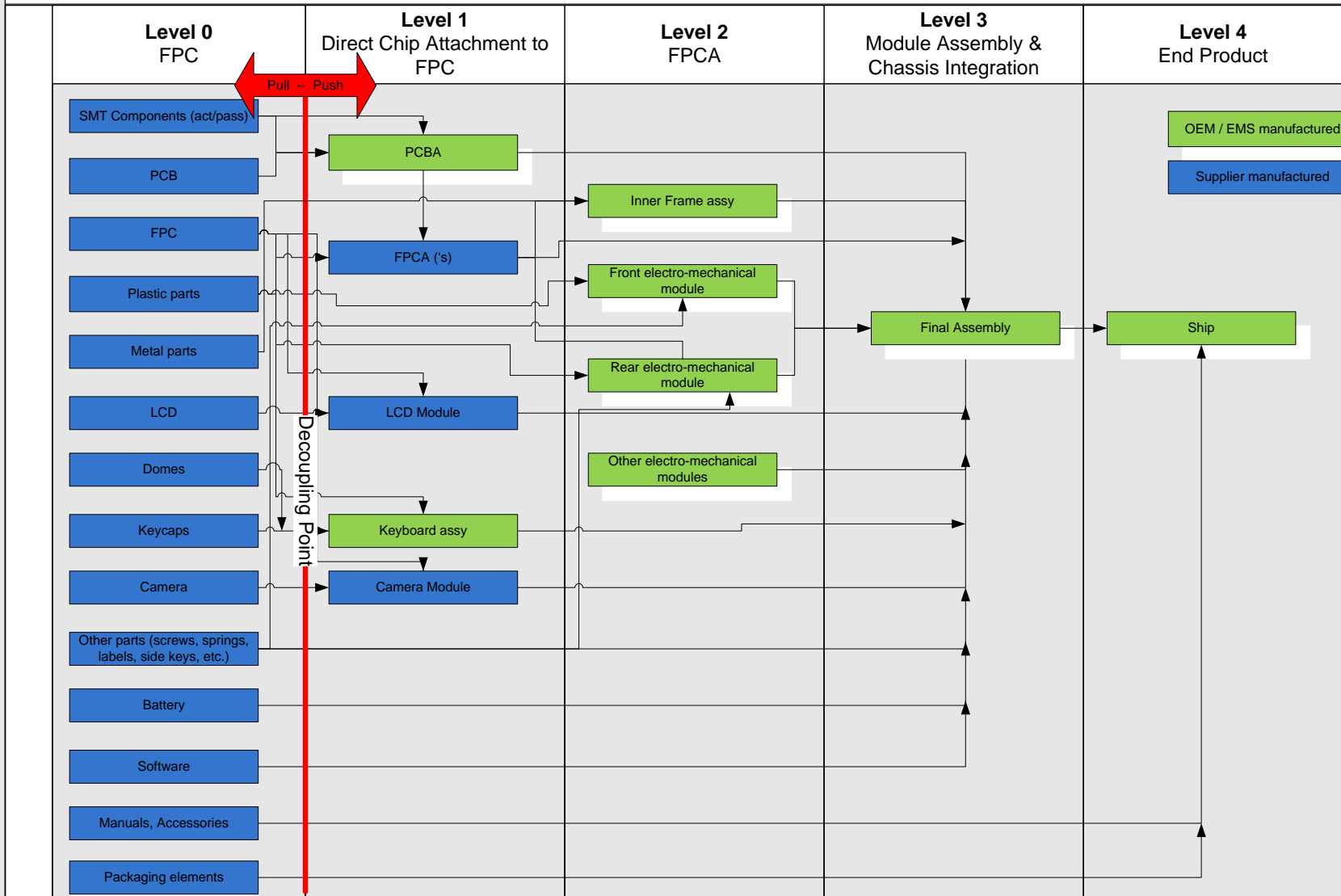


## MFLEX Clustered Supply Chain Solution



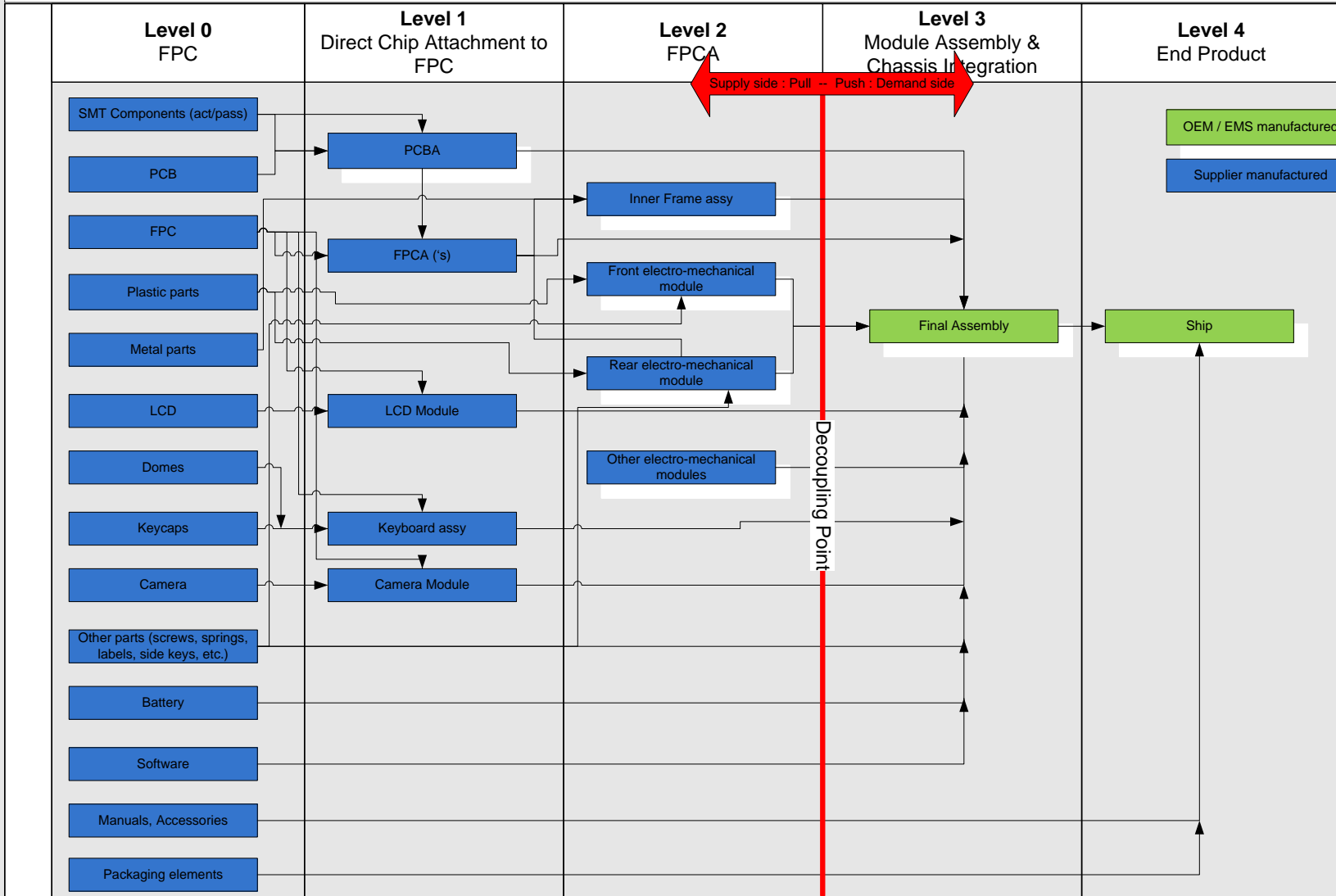
# Traditional Supply Chain

**Traditional Supply Chain (typical example)**



# Integrated or “clustered” Supply Chain

Integrated or “clustered” Supply Chain (typical example)



# Benefits of a Reduced Supply Chain (in general)

1. Ability of the Supply Chain to respond to demand changes (SC flexibility)
 

*“the further downstream the decoupling point can be set, the higher is the flexibility of the supply chain”* (Brumme 2010)

  - a. Upwards flexibility (demand goes up):
    - Ability to deliver against increased demand
    - Question: *How much sales opportunities are lost due to unavailability of a given model in the shops?*
    - Quantifiable through the Marketing department
  - b. Downwards flexibility (demand goes down):
    - Prevention of inventory build up across the SC through fast reaction time of a shortened SC
    - Quantification: see next slide

## Benefits of a Reduced Supply Chain (in general)

### 2. Reduced inventory across the supply chain

- Overall less inventory across the SC through less suppliers
- Inventory risk stays with the module supplier

#### Quantification:

- No rule of thumb
- Design specific (how “modular” is the design?)
- Estimation: 5-20% should be feasible

### 3. Quality of the Supply Chain

- Any Supply Chain is only as good as its weakest member
- The more suppliers in the chain the higher the risk of having a real bad one
- Methodologies to assess the quality of a Supply Chain exist by specialized consultants

## 4. Increased product quality

- Higher integrated parts provide higher robustness in shipping
- Setting up the vertical integration path...
  - ... according to fragility
  - ... not according to size

Quantification (example based on MFLEX real product experience):

- Traditional EMS FPCA yield (real product experience) : 92-95% (optimistic)
- Current Module yield (at EMS): >98%
- Example calculation:
  - Value of the sub module: 20 USD
  - Lifetime volume: 10 m units
  - Yield difference: 3% (see above)
  - $20\text{USD} * 10,000,000 * 0.03 = \underline{\underline{6,000,000 \text{ USD}}}$

## Benefits of a Reduced Supply Chain (in general)

### 5. Reduced number of SKU's

- Reduced cost of sourcing:
  - Supplier management in general
  - Cost per transaction
  - Sourcing fix cost reduction

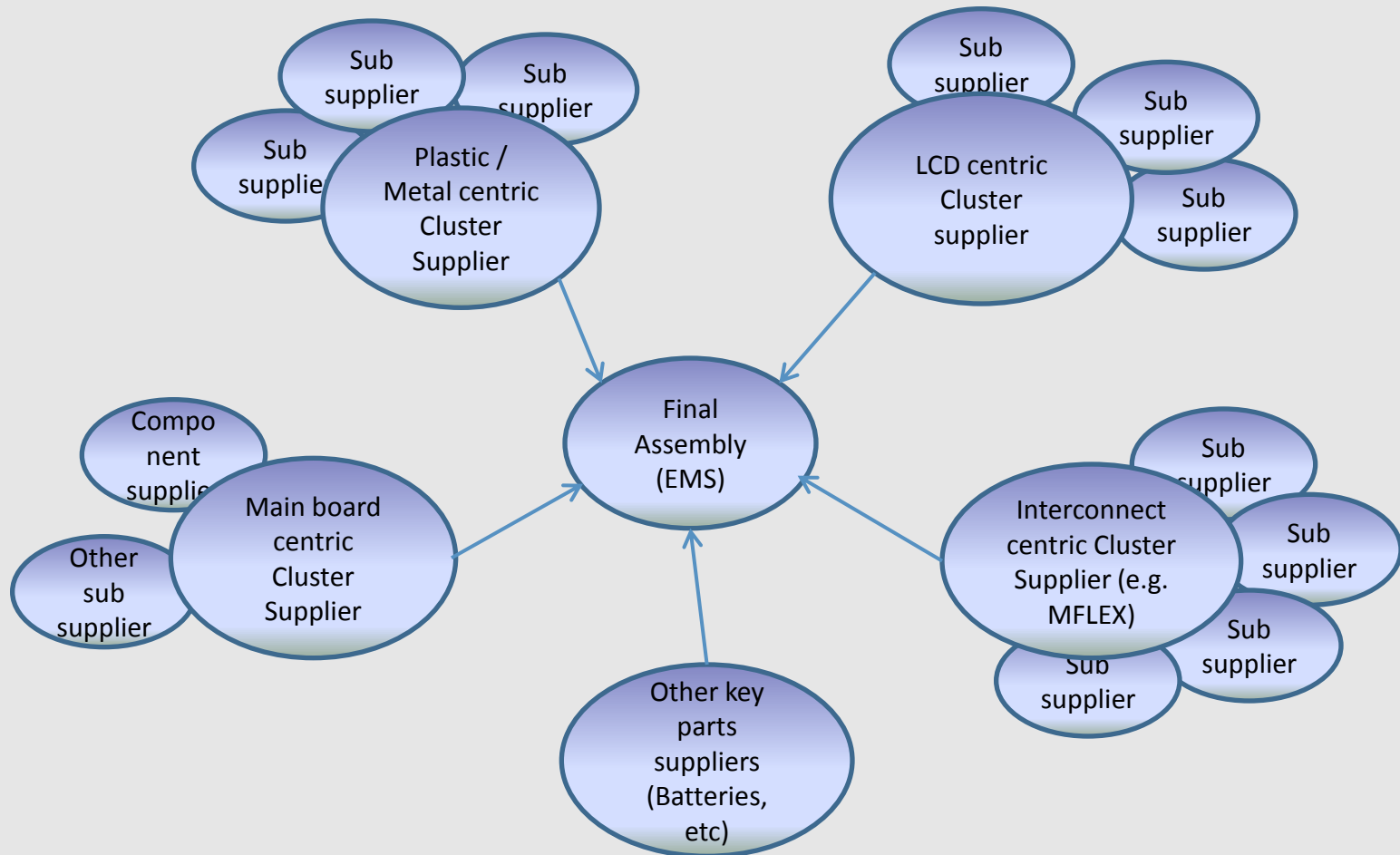
#### Quantification (example):

- Traditional SC: 7 SKU's at EMS
- Reduced supply chain through cluster sourcing: 5
- Reduction: 29%
  - Linear applicable on cost per transaction
  - Partially applicable on sourcing fix cost

## Elements of a Cluster Sourcing Strategy:

- Having a set of “Key” or “Cluster” Suppliers in place. Their competencies must include:
  - At least one key technology as core competence
  - Ability to vertical integrate
  - Mature supplier management system in place
  - Global presence
  - Low cost manufacturing
- These Cluster Suppliers must be able to deliver their “cluster” at full responsibility:
  - Fully functional tested
  - With VMI

# Cluster Sourcing Strategy



# Conclusion

- Secure partner for a robust supply chain
- Unique capability & scale up for FPCA & integrated chassis assembly
  - Intricate flex circuit assembly integrating with chassis assembly for high-volume, small form factor consumer electronics
- Reduce total cost in a commodity market
  - Early Supplier Involvement – Design for Supply Chain
  - Inventory reduction through integration
  - Delivering high quality
  - Low cost concentrated China footprint
  - Large scale material procurement & management
- Enabling Rapid Growth
  - Highly responsive
  - Rapid turnaround of product designs
  - Short ramp-up time to high-volume production
  - World-class New Product Introduction (NPI) teams & engineering methods
- Custom-built FPCA & Module Integration Factories to maintain new product launch secrecy

## Contact Info

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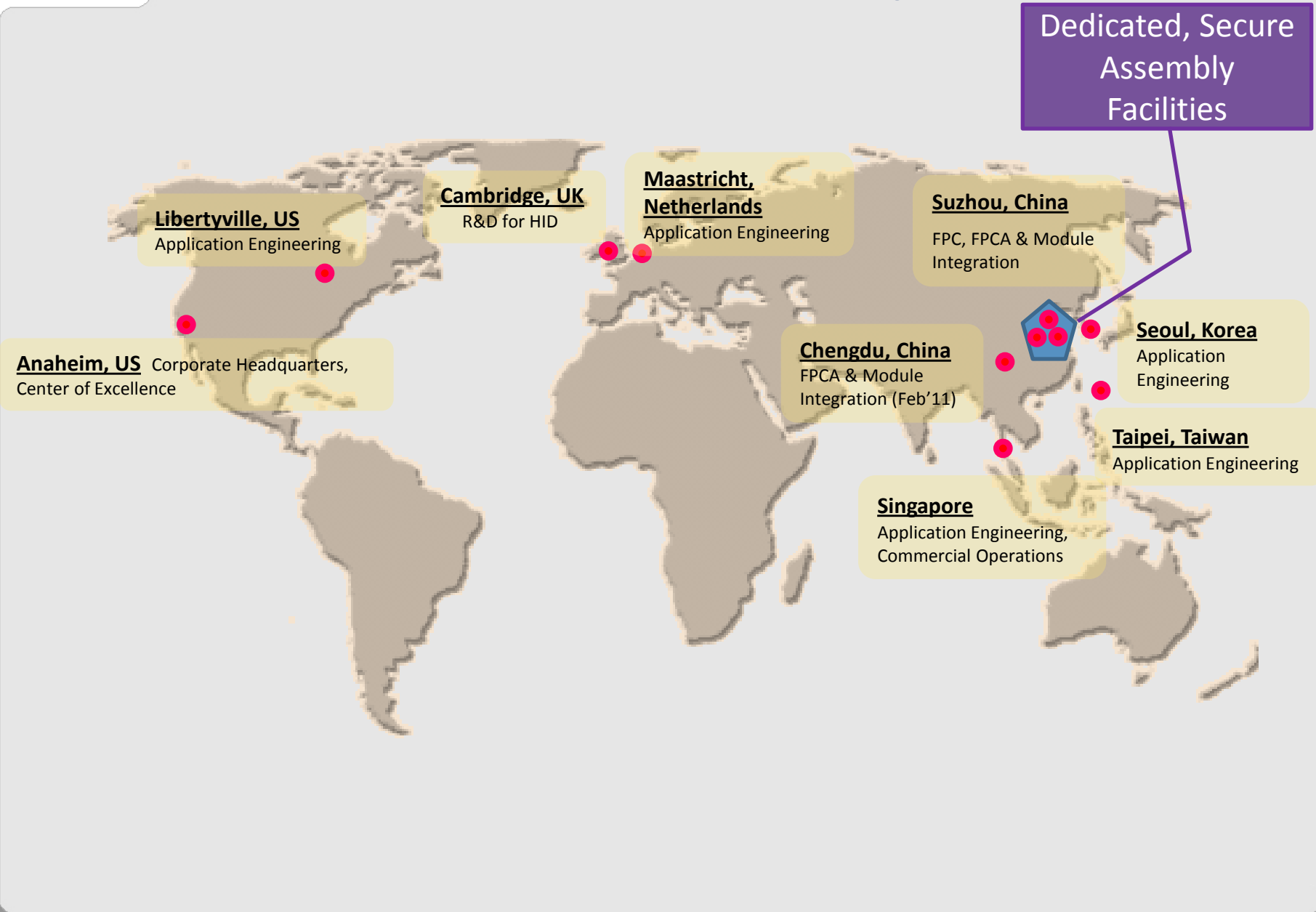
Cell: +1.714.308.6590

www.mflex.com

NASDAQ: MFLX

# Appendix

# Global Low Cost Footprint



# MFLEX Ranked #35 on FORTUNE's 100 Fastest Growing Companies



**FORTUNE**

Home Fortune 500 Fortune Tech Street Sweep Invest

## 100 FASTEST-GROWING COMPANIES

*The world's supercharged performers*

Full List Near You CEOs Top Companies

Top 100 Companies Industries

### Top 100

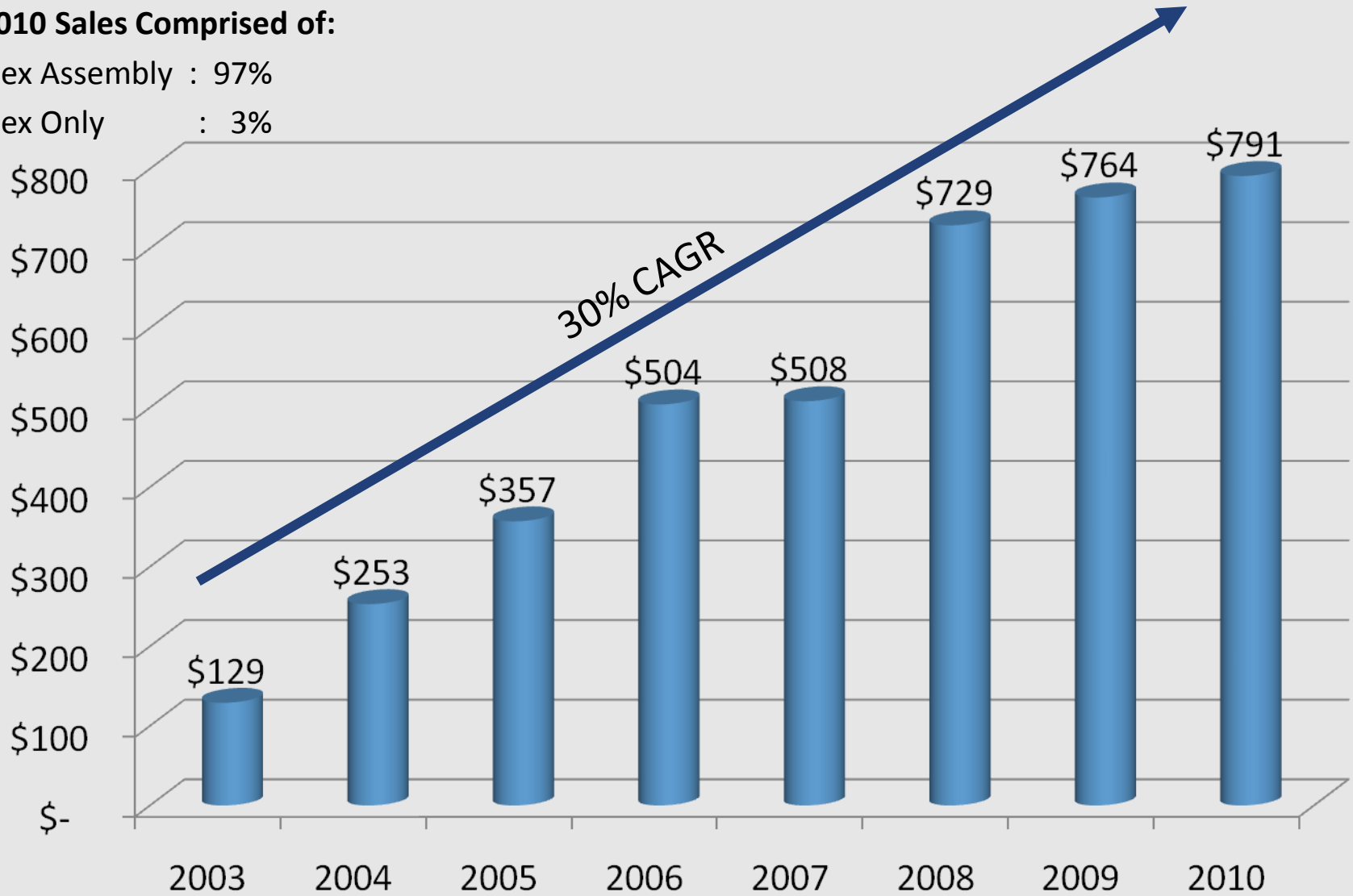
Rank	Company	EPS growth*	Revenue growth*	Total return*
1	Eldorado Gold	119%	47%	46%
2	Green Mountain Coffee Roasters	98%	55%	64%
30	Amazon.com	53%	31%	17%
31	Cubist Pharmaceuticals	85%	42%	1%
32	Deckers Outdoor	48%	41%	12%
33	Research In Motion	62%	76%	-10%
34	Celgene	83%	44%	-4%
<b>35</b>	<b>Multi-Fineline Electronics</b>	<b>88%</b>	<b>20%</b>	<b>13%</b>
36	Valassis Communications	51%	22%	23%
37	Cognizant Technology Solutions	55%	30%	10%
38	Compass Minerals International	56%	16%	30%
39	ANSYS	66%	22%	15%
40	Olin	43%	111%	0%
41	Lincoln Educational Services	75%	22%	11%
42	Lumina	61%	33%	46%

# Revenue Growth

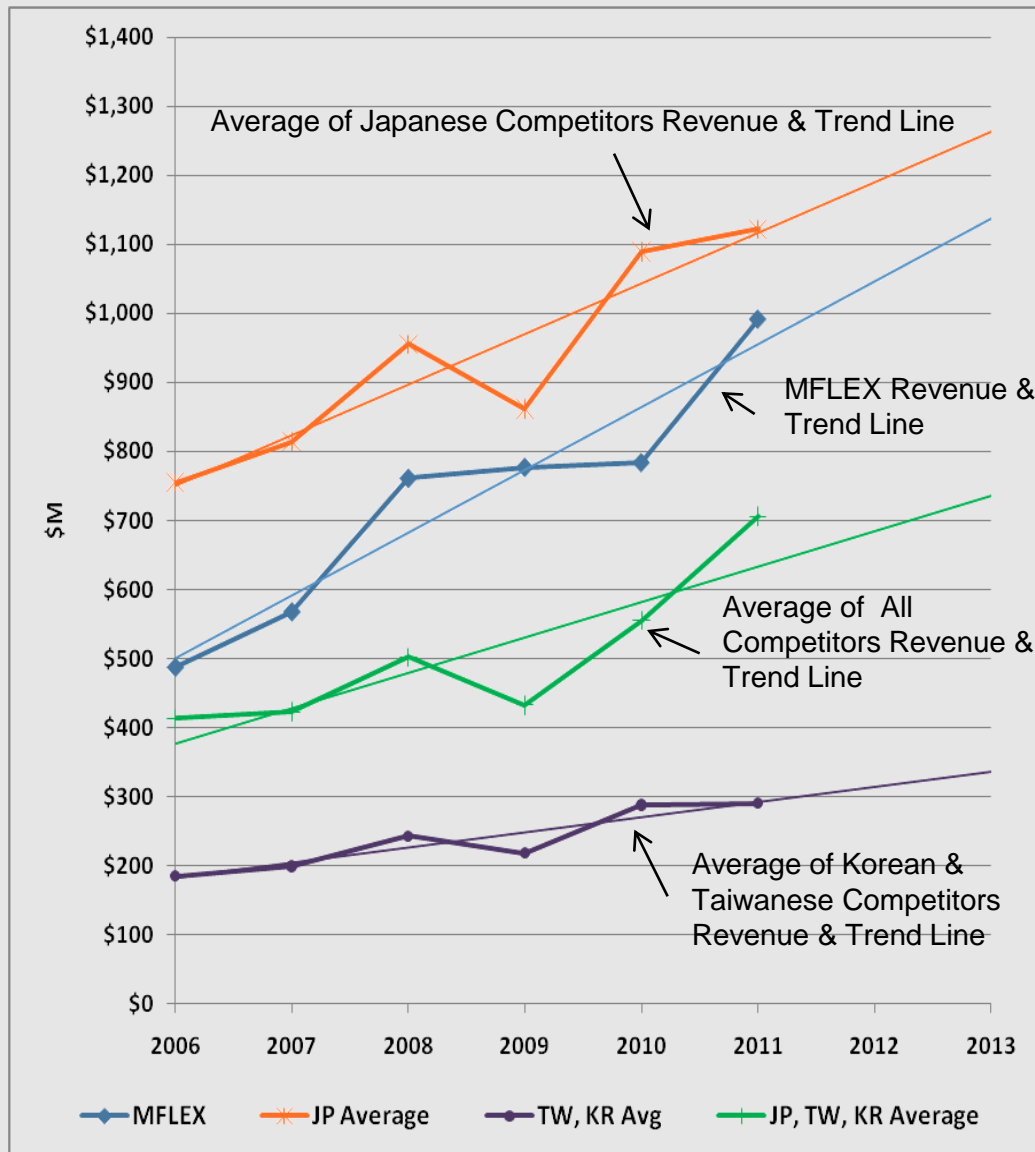
## 2010 Sales Comprised of:

Flex Assembly : 97%

Flex Only : 3%



# CY Revenue & Trend Line for Average of Japanese v/s Korean & Taiwanese v/s Japanese, Korean & Taiwanese v/s MFLEX



## Key Takeaways :

- Even though MFLEX revenue is smaller than the Average of Japanese Competitors revenue, MFLEX CAGR of 15.2% is higher than the Average of Japanese Competitors CAGR of 8.2%
- All Competitors (combination of Japanese , Korean & Taiwanese) Average CAGR is 11.3%
- Combination of Korean & Taiwanese Competitors Average CAGR is 9.4%

Source :  
Company Financial Information,  
Industry Analysts Reports

# History



1994 - MFC1



1995 - Corporate



2004 - MFC2



2006 - MFC2  
Expansion



2010 - MFC3  
Expansion



2011 Chengdu  
FPCA Expansion



**1984**  
MFLEX  
started  
as a Flex  
Mfr

**1990**  
Began Flex  
assembly  
offering

**1994**  
Began  
manufacturing  
in Suzhou, China  
(MFC1)

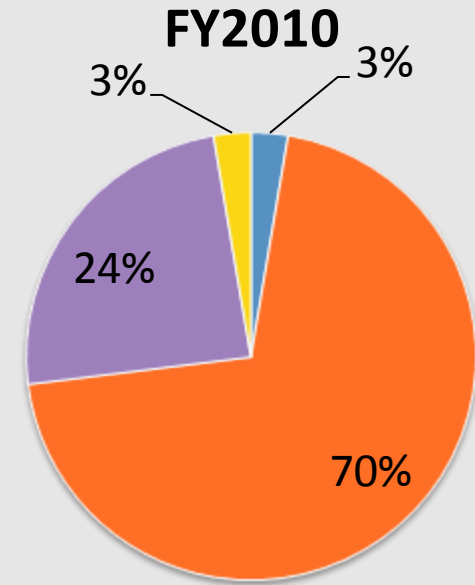
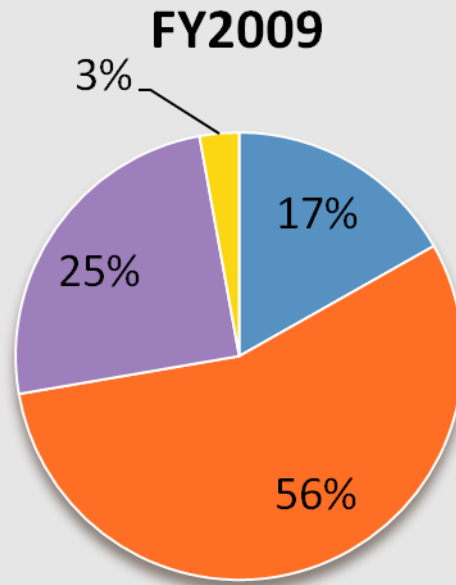
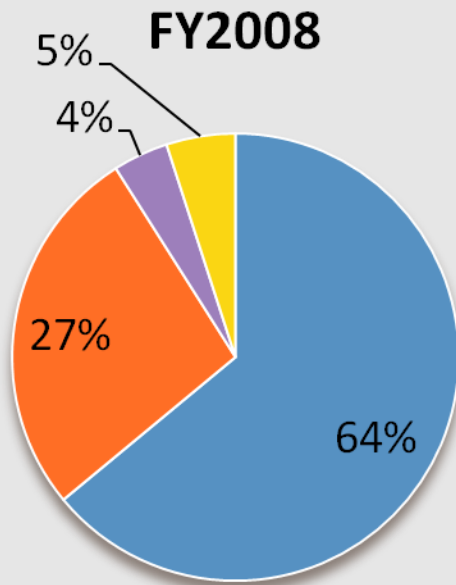
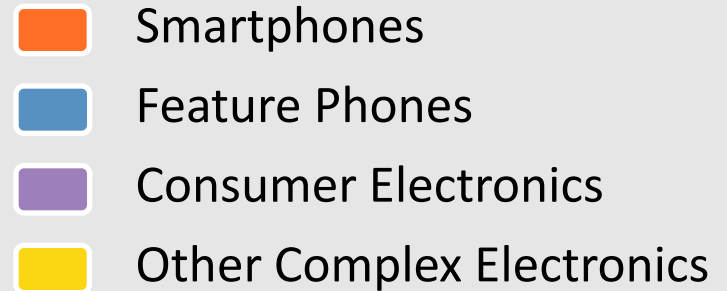
**2004**  
Capacity expansion  
for growth (MFC2) in  
Suzhou, China

**2008**  
Acquired Pelikon (UK),  
Established Center of  
Excellence,  
Setup Assembly Facility  
in Malaysia

**2010**  
Capacity & Capability  
Expansion (MFC3) in  
Suzhou, China  
Start construction in  
Chengdu

# MFLEX Revenue Distribution

- High-volume, high-complexity flex fabrication & component assemblies
- High-level integration into chassis



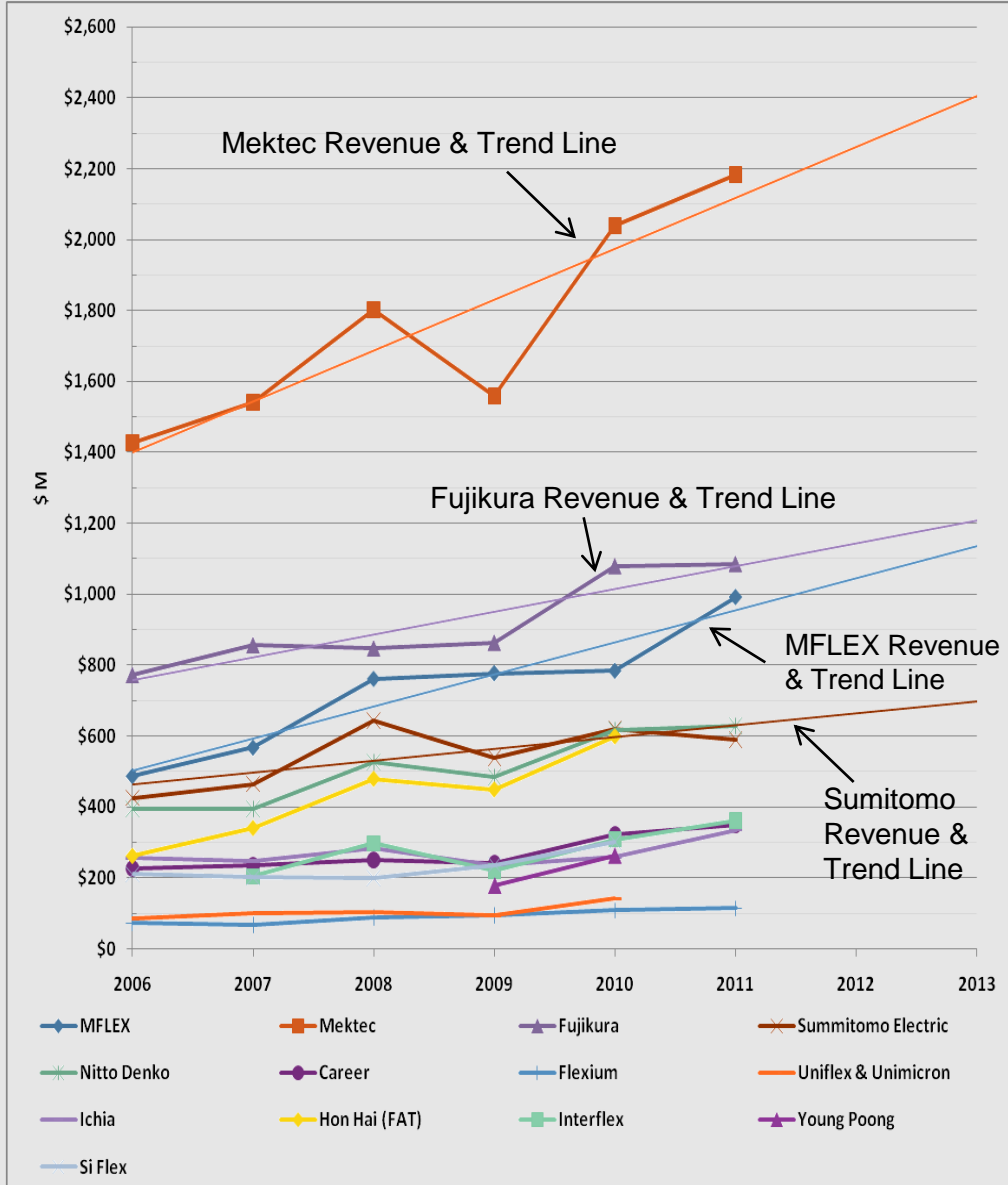
\* Fiscal Year Ends September 30

## Top 12 Flex Circuit Fabricators in CY 2009

Ranking	Company & Location	CY 2009 Revenues US \$ million
1	Nippon Mektron (JP)	1510
2	Fujikura (JP)	849
3	MFLEX (US)	790
4	Sumitomo Electric (JP)	553
5	Nitto Denko (JP)	424
6	3M (US)	280
7	SI Flex (KR)	222
8	Interflex (KR)	215
9	Career Technology (TW)	206
10	Hon Hai Precision Industry (TW)	204
11	Young Poong (KR)	169
12	Ichia Technologies (TW)	126

Source: Japan Marketing Survey FPC & Rigid-Flex PCB Report 2010

# CY Revenue by Competitor by Year



## Key Takeaways :

- Even though it appears that Mekttec is growing fastest, CAGR for MFLEX v/s Japanese competitors
    - MFLEX : 15.2%
    - Nitto Denko : 9.7%
    - Mekttec : 8.9%
    - Fujikura : 7.0%
    - Sumitomo : 6.7%
  - CAGR for Taiwanese competitors
    - HonHai (FAT) (\*) : 23.0%
    - Unimicron/Uniflex (\*) : 13.5%
    - Flexium : 9.3%
    - Career : 9.1%
    - Ichia : 5.7%
  - CAGR for Korean competitors
    - Young Poong : 46.9% (only 2 data points)
    - Interflex (\*) : 15.4%
    - SI Flex (\*) : 9.5%
- (\*) These companies had 5 data points, all others had 6 data points

# Forward-Looking Language Statement

This includes forward-looking statements that involve risks and uncertainties. These forward-looking statements include, but are not limited to, statements and predictions regarding revenues, net sales, sales, net income, operating expenses, capital expenditures, profitability, gross margins, including, without limitation, the company's targeted range of gross margins and the company's achievement of margins within or outside of such range, yields, the growth of, and trends in, the electronics (including camera and mobile phones, flex and rigid flex) markets, and statements regarding our competitors, our competitive strengths, plans regarding our optical strategy, emerging market opportunities, our technology advancement and our next steps with respect thereto, including in HDI, rigid flex, and MMP, capacity expansion opportunities, the company's diversification efforts, the company's relationship and opportunities with, and expected sales to, its customers, the relative size of each customer to the company, the company's objectives and strategies, product trends, market opportunities, and the utilization of flex and flex assemblies, current and upcoming programs and product mix, the company's manufacturing capabilities, capacity, growth and expansion of the company's facilities/capacity and equipment installation and the costs associated therewith. Additional forward-looking statements include, but are not limited to, statements pertaining to other financial items, plans, strategies or objectives of management for future operations, financial condition or prospects, and any other statement that is not historical fact, including any statement which is preceded by the words "assume," "can," "will," "plan," "expect," "estimate," "aim," "intend," "project," "foresee," "target," "anticipate," "may," "believe," or similar words. Actual events or results may differ materially from the company's expectations. Important factors that could cause actual results to differ materially from those stated or implied by the company's forward-looking statements include the impact of changes in demand for the company's products, the company's success with new and current customers, the company's ability to develop and deliver new technologies, the filing or outcome of any litigation by or against the company, the company's ability to diversify and satisfy its customer base, the company's effectiveness in managing manufacturing processes and costs and expansion of its operations, the degree to which the company is able to utilize available manufacturing capacity, enter into new markets and execute its strategic plans, the company's ability to manage quality issues and yields, the impact of competition, pricing pressures and of technological advances, weather conditions in China, and other risks detailed from time to time in the company's SEC reports, including its recent Quarterly and Annual Reports on Forms 10-Q and 10-K. These forward-looking statements represent the company's judgment as of the date of this presentation. The company disclaims any intent or obligation to update these forward-looking statements.