Electronics Supply Chain Challenges and Solutions
(Shortages and Obsolescence and Poor Quality, Oh My!)

Jason Jowers, CTrends
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Agenda

Shortages
Obsolescence
Quality
Discussion
Shortages and Obsolescence
Shortages
Scope
Impact

Manufacturing Delays
Impact

Lost Profits
Penalties of Late Delivery
Lost Customers
Causes
Causes
Causes
Mitigation
Mitigation
Data
Align with the Right Suppliers
Mitigation

Relationships
Mitigation

Supplier Agreements
Alternate Suppliers and Part Numbers
Stay Prepared
Obsolescence
Scope

22,000
Scope

60%
Impact

Manufacturing Delays
Impact

Redesign
Impact

Inventory
Causes

Planned Obsolescence
Causes

Value of Semiconductor M&A Agreements

Prior to 2015 annual average = $12.6B

Source: IC Insights

Reduced by canceled transactions (including Qualcomm's planned $39B purchase of NXP).

$107.3B
$100.4B

$59.3B

$7.7B $17.0B $9.5B $11.8B $16.9B $28.1B $23.2B

Mitigation

Design with Obsolescence in Mind
Mitigation

Information Management
Forecast Demand
Mitigation
Mitigation

Alternate Part Number
Mitigation
Mitigation

Alternate Part Number
Mitigation

After Market Manufacturer
Mitigation

Independent Distribution
Types of Electronic Components Reported in 2018 vs. previous 10 years.
(component types that make up less than 1% were omitted)

- Capacitor
- Programmable Logic IC
- Memory IC
- Transistor
- Other
- Analog IC
- Diode
- Microprocessor IC
- Logic IC
- Interface IC
- Optoelectronic Device
- Resistor
- Telecom IC
- Power Supplies

2007-2017 vs. 2018

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49.9% of all parts reported in 2018 were attributed to 12 of 147 manufacturers
(component types that make up less than 1% were omitted)

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>XILINX INC</td>
<td>8.28%</td>
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<tr>
<td>MURATA MANUFACTURING CO LTD</td>
<td>6.52%</td>
</tr>
<tr>
<td>VISHAY</td>
<td>4.39%</td>
</tr>
<tr>
<td>ALTERA CORP</td>
<td>4.02%</td>
</tr>
<tr>
<td>ST MICROCIRCUITS ELECTRONICS CORP</td>
<td>4.02%</td>
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<tr>
<td>ST MICROELECTRONICS</td>
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<tr>
<td>MICRON TECHNOLOGY INC</td>
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<td>ANALOG DEVICES INC</td>
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<tr>
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<tr>
<td>TEXAS INSTRUMENTS INC</td>
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<tr>
<td>NATIONAL SEMICONDUCTOR CORP</td>
<td>2.89%</td>
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<tr>
<td>INTEL CORP</td>
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<tr>
<td>SAMSUNG SEMICONDUCTOR INC</td>
<td>2.76%</td>
</tr>
</tbody>
</table>
Product Failure
Impact

Manufacturing Delays
Impact

Failure Analysis and Rework
Causes

Greed
Mitigation

Avoidance
Mitigation

Detection
Summary

Shortages
Obsolescence
Quality
Discussion
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