SUMMARY

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2021 Begins with a Chip Shortage

What is Driving It? What is the Impact?

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Issue

As demand for electronics and electronics components grows in 2021 it is anticipated that supply chain pressure will build. Recent ECIA research and analysis has identified extending lead times for a broad range of electronic components. However, specific component sectors will see greater challenges as the ability of suppliers to increase production is limited by capacity constraints.

Joel Huskra brought focus to the issue of shortages of 200 mm wafer capacity for semiconductors in an article published in December 2020 on the website ExtremeTech.com. Those interested in reading the full article can access it by following the link attached to the article title below:

A Massive Chip Shortage Is Hitting the Entire Semiconductor Industry

A top-level summary of selected issues identified in the article are:

- A new explanation for what's causing widespread problems across many markets is the insufficient investment in 200 mm wafers.
- While significant amounts of production have shifted to 300 mm wafers and smaller process geometries, major foundries such as TSMC and Samsung still run 200mm fab lines. Several second-tier foundries also run 200 mm wafers such as: GlobalFoundries, SMIC, UMC, TowerJazz, and SkyWater.
- The economics of chip design and production drive attractive, lower-cost solutions produced at larger process geometries on 200 mm wafers. Many IoT and 5G chips are built on 200mm, as are many analog processors, power management devices, MEMS devices, image sensors, RF components, etc.
- As demand for these components has grown, 200mm capacity has become constrained. Large foundries like TSMC have been slow to add new 200mm capacity. Utilization was already high at many 200 mm fabs before the pandemic hit.
- As demand for automotive electronics has rebounded, the shortage of chips produced on 200mm wafers has become much more acute. The typical car requires anywhere from 50 to 150 semiconductors.
- Automaker difficulties in securing adequate supplies of chips are heightened due to the lower priority they receive from semiconductor manufacturers. Higher volume / higher profit margin orders are positioned at the head of the line in tight supply situations.

Reports in the second week of January 2021 revealed the large impact of shortages of semiconductors. It was reported that Ford and Nissan have been forced to scale back production in response to semiconductor shortages. Other automakers are also confronting challenges due to chip shortages including Volkswagen, Fiat Chrysler, GM, and Subaru.

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To gain expert analysis of this growing challenge, ECIA reached out to **Len Jelinek** for his insights on this issue. Jelinek is recently retired as a Chief Analyst and top manager at Omdia (previously IHS Markit.). He is widely recognized as one of the world's foremost authorities on semiconductor manufacturing issues and his analysis and insight is sought by top executives in the semiconductor industry around the world. His multi-dimensional analysis is presented in this report. Also, addition details regarding the impact on Automobile production and recommendations for participants in the supply chain is presented.