



Task Force
Global Semiconductors

04.11.2021

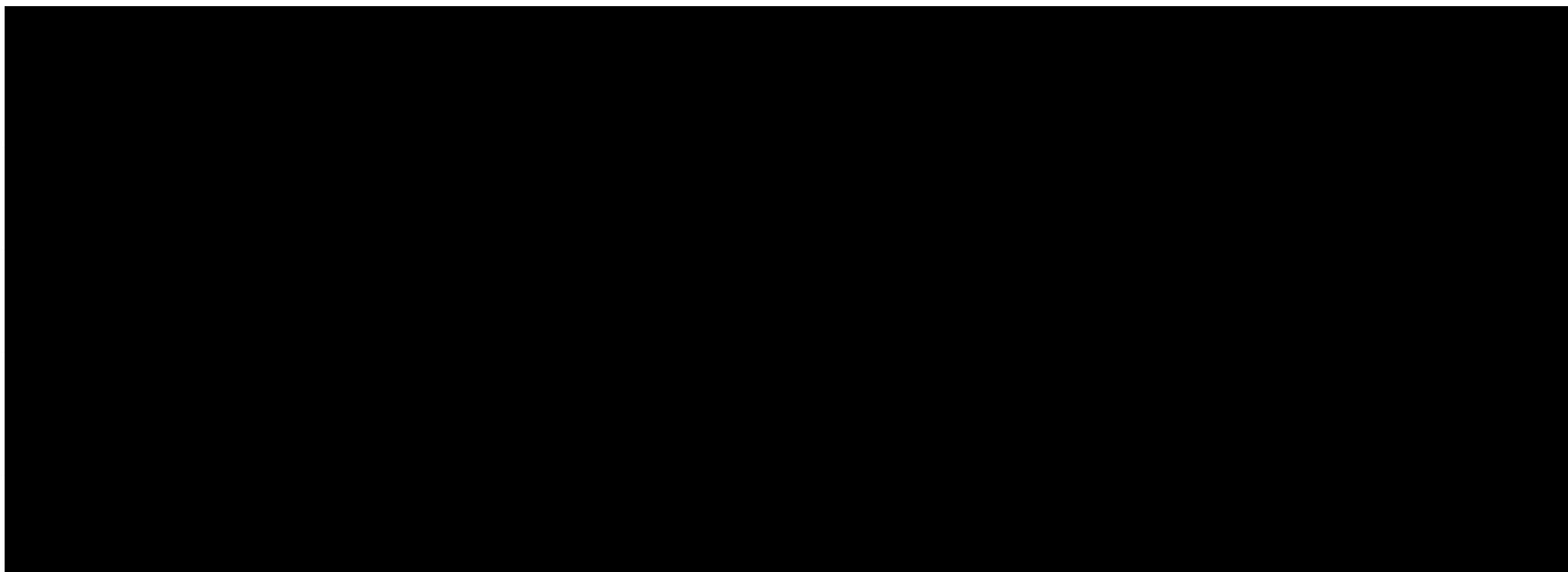
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Agenda

1. Automotive Semiconductor Business
2. Bosch and the Semiconductor Business
3. Background Semiconductor Shortage
4. Bosch's Approach to the Automotive Semiconductor Shortage
5. Semiconductor Shortage and the Future

Executive Summary



AUTOMOTIVE SEMICONDUCTOR BUSINESS

Automotive Semiconductor Business

Steps in semiconductor manufacturing

Automotive Semiconductor Business

Automotive industry represents only 10% of semiconductors

Automotive Semiconductor Business

Automotive semiconductor growth is driven by safety & powertrain

Automotive Semiconductor Business

Automotive semiconductor market is less concentrated

Automotive Semiconductor Business

Foundry players are increasing their share

Automotive Semiconductor Business

Strong invest in new equipment to satisfy increasing demand

Automotive Semiconductor Business

BOSCH AND THE SEMICONDUCTOR BUSINESS

Bosch and the Semiconductor Business

Bosch and the Semiconductor Business

We continue investing in semiconductor manufacturing capacities

Current Bosch investments



Key investments

- ▶ Tool investments in **Dresden (BCD, PowerMOS)**
- ▶ Building and tool investment in **Reutlingen (BCD, MEMS, SIC)**
- ▶ Investments in backend

Bosch and the Semiconductor Business

BACKGROUND SEMICONDUCTOR SHORTAGE

Background Semiconductor Shortage

Background Semiconductor Shortage

Start of the shortage in 2020 due to COVID-19



Semiconductor **capacity shifted** to other segments during first COVID-19 shutdowns



Sharp increase for automotive demand after first COVID-19 lockdowns



Consumer goods and communications segments **“booming”**

Capacity allocated to automotive industry **does not meet demand**

Aggravation in 2021 due to additional Force Majeure events and recurring COVID-19 implications

Early 2021 – Impacts on frontend manufacturing



Texas winter storm impacts NXP plants with >4 weeks production loss



Fire at Renesas plant leads to production loss of several months

Mid 2021 – Impacts on backend manufacturing



COVID-19 restrictions have led to shutdowns across South-East Asia

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Background Semiconductor Shortage

The shortage is the dominating topic for the automotive industry

Press voices

Auto

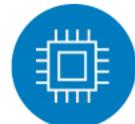


- “**Tesla shares drop** after muted Q1 results as a global chip crunch persists
- “**South China Morning Post**
- “**NIO may fail to meet its second-quarter output goal** as global chips shortage hits home for EV maker
- “**Engadget**
- “**Ford, BMW and Honda cut production** due to global chip crisis



- “**Ford slumps 10%** after being hit by chip shortage, drags down rival GM, suppliers
- Bloomberg**
- “**Volkswagen warns** chip shortage to curb output in coming months

Consumer electronics



- “**Apple CEO Tim Cook warned** that semiconductor shortages **are crimping sales of iPads and Macs**
- TECHSPOT**
- “**Samsung warns** ongoing chip shortage could impact production of its smart TVs



- “**NVIDIA brings back** the GTX 1050 ‘F to mitigate the global GPU shortage
- FT FINANCIAL TIMES**
- “**Cisco says** shortages of semiconductors will **disrupt supply chains** for rest of year

Source: Reuters Engadget Business-Insider TechSpot South China Morning Post Bloomberg

Industry voices



- “**We see the biggest risks at the semiconductors.** There is a fundamental shortage of chips [...]. This will impact our plants also in the next months, if not years.

Herbert Diess, VW chairman



- “**Apple would take a \$3 billion to \$4 billion revenue hit** as a result of the semiconductor chip shortage. It's a combination of the shortages as well as the very, very high level of demand that we are seeing for both iPad and iMac

Luca Maestri, Apple CFO



- “**We think we've got another six months to get through the short term.**

Chuck Robbins, Cisco CEO



Background Semiconductor Shortage

Background Semiconductor Shortage

BOSCH'S APPROACH TO THE AUTOMOTIVE SEMICONDUCTOR SHORTAGE



Bosch's Approach to the Automotive Semiconductor Shortage

SEMICONDUCTOR SHORTAGE AND THE FUTURE

Robert Bosch LLC's BIS Confidentiality Statement in Support of its Submission in Response to the Department of Commerce's Semiconductor Supply Chain Request for Public Comment (Docket No. BIS 2021-0036)

The enclosed submission by Bosch contains Business Confidential information. Bosch has identified the portions of its submission that contain Business Confidential information, and Bosch has filed a non-confidential version of the submission.

This Business Confidential information is protected from disclosure pursuant to 5 U.S.C. § 552(b)(4). Exemption 4 of the Freedom of Information Act protects from disclosure “commercial or financial information [that is] obtained from a person and is confidential.” 5 U.S.C. § 552(b)(4).

The term “commercial or financial” has been broadly interpreted to include any records in which the submitter has a commercial interest. *See Pub. Citizen Health Res. Grp., v. FDA*, 704 F.2d 1280, 1290 (D.C. Cir. 1983). The term “commercial” ... means anything pertaining or relating to or dealing with commerce.” *Am. Airlines, Inc. v. Nat'l Mediation Bd.*, 588 F.2d 863, 870 (2d Cir. 1978).

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Finally, Bosch is producing this Business Confidential information pursuant to an express assurance of privacy. The Federal Register Notice seeking information contains instruction about how to identify, protect, and file Business Confidential information (*see* 86 FR 53031) and the “Frequently Asked Questions” accompanying the Notice also provide an assurance of confidentiality. *See* <https://www.bis.doc.gov/index.php/documents/pdfs/2844-2021-semiconductor-frn-faqs-9-24/file>

I hereby certify that the foregoing is true and correct.

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