Automotive Division Call
hosted by Liberum
Peter Schiefer, Division President Automotive (ATV)
5 October 2020
Market position and short- and mid-term outlook
Infineon has been growing by 10% p.a. in automotive semis over the last two decades and hence steadily gaining market share.

**Infineon’s automotive semiconductor revenue (in USD for CY; based on market figures by Strategy Analytics)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue [USD m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>740</td>
</tr>
<tr>
<td>2002</td>
<td>1000</td>
</tr>
<tr>
<td>2004</td>
<td>1307</td>
</tr>
<tr>
<td>2006</td>
<td>1818</td>
</tr>
<tr>
<td>2008</td>
<td>2270</td>
</tr>
<tr>
<td>2010</td>
<td>2890</td>
</tr>
<tr>
<td>2012</td>
<td>4210</td>
</tr>
<tr>
<td>2014</td>
<td>4987</td>
</tr>
<tr>
<td>2016</td>
<td>830</td>
</tr>
<tr>
<td>2018</td>
<td>4157</td>
</tr>
</tbody>
</table>

**CAGR (00-18): +10.1%**

- **Infineon** #3, market position: 6.7%
- **International Rectifier** #2, market position: 7.9% - 11.2%
- **Cypress** #1, market position: 13.4%

Source: Strategy Analytics: *Automotive Semiconductor Vendor Market Shares*. 2001 through 2020
Infineon’s top market position is built on system competence based on an industry-leading product portfolio.

Automotive semiconductors (2019 total market: $37.2bn)

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infineon</td>
<td>13.4%</td>
</tr>
<tr>
<td>NXP</td>
<td>11.3%</td>
</tr>
<tr>
<td>Renesas</td>
<td>8.7%</td>
</tr>
<tr>
<td>TI</td>
<td>8.1%</td>
</tr>
<tr>
<td>STMicro</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

› New #1 in the total market post acquisition of Cypress
› Solid #1 in power despite xEV subsidies cut in China in H2 CY19
› Undisputed #1 in automotive NOR Flash memory
› Fostering #2 in sensors (from 10.4%\textsubscript{CY12} to 13.5%\textsubscript{CY19})
› Significant market share gain in microcontroller – both organically (strong demand for AURIX\textsuperscript{TM}) and via Cypress acquisition

<table>
<thead>
<tr>
<th>Sensors</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bosch</td>
<td>14.1%</td>
</tr>
<tr>
<td>Infineon</td>
<td>13.5%</td>
</tr>
<tr>
<td>ON Semi</td>
<td>8.0%</td>
</tr>
<tr>
<td>NXP</td>
<td>7.0%</td>
</tr>
<tr>
<td>Melexis</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Microcontrollers</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>NXP</td>
<td>27.2%</td>
</tr>
<tr>
<td>Renesas</td>
<td>27.0%</td>
</tr>
<tr>
<td>Infineon</td>
<td>16.2%</td>
</tr>
<tr>
<td>TI</td>
<td>9.8%</td>
</tr>
<tr>
<td>Microchip</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power semiconductors</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infineon</td>
<td>25.5%</td>
</tr>
<tr>
<td>STMicro</td>
<td>13.9%</td>
</tr>
<tr>
<td>Bosch</td>
<td>9.1%</td>
</tr>
<tr>
<td>TI</td>
<td>8.2%</td>
</tr>
<tr>
<td>ON Semi</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

Source: Strategy Analytics: Automotive Semiconductor Vendor Market Shares v2. May 2020. The market shares shown here are the combined market shares of Infineon and Cypress based on their individual figures.
Market recovery expected to continue across all regions; high demand for xEV in Europe; L1/L2/L2+ penetration on schedule

<table>
<thead>
<tr>
<th>Market Outlook for Q4 CY20</th>
<th>Market Outlook for CY21</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Car units</strong></td>
<td></td>
</tr>
<tr>
<td>› Continued recovery of car sales and production</td>
<td>› Y-Y recovery with unit growth at mid-teens %</td>
</tr>
<tr>
<td><strong>eMobility</strong></td>
<td></td>
</tr>
<tr>
<td>› Strong momentum in Europe</td>
<td>› Incentives and CO₂ regulations should keep demand high; especially in Europe</td>
</tr>
<tr>
<td>› Some recovery in the US and China</td>
<td>› Improving consumer sentiment around sustainability theme</td>
</tr>
<tr>
<td><strong>xEV</strong></td>
<td></td>
</tr>
<tr>
<td>› No major change in OEMs’ plans in near-term</td>
<td>› Steady investments in EV charging infra-structure further lowering reservation towards EVs</td>
</tr>
<tr>
<td>› L2 growth to continue</td>
<td></td>
</tr>
<tr>
<td><strong>ADAS/AD</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Infineon; based on or includes content supplied by IHS Markit, Automotive Group: Light Vehicle Production Forecast. September 2020.
After nearly 20% y-y decline globally in CY20 due to COVID-19, all regions are forecast to snap back in CY21

**Light vehicle production (year-over-year growth)**

<table>
<thead>
<tr>
<th>Region</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2021-2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America (16.3m units in 2019)</td>
<td>-3.8%</td>
<td>-20.9%</td>
<td>17.6%</td>
<td>1.8% p.a.</td>
</tr>
<tr>
<td>Europe (21.1m units in 2019)</td>
<td>-3.8%</td>
<td>-24.1%</td>
<td>16.7%</td>
<td>2.5% p.a.</td>
</tr>
<tr>
<td>Greater China (24.7m units in 2019)</td>
<td>-8.1%</td>
<td>-9.1%</td>
<td>6.3%</td>
<td>4.7% p.a.</td>
</tr>
<tr>
<td>Japan / Korea (13.1m units in 2019)</td>
<td>-0.7%</td>
<td>-17.1%</td>
<td>7.2%</td>
<td>1.5% p.a.</td>
</tr>
<tr>
<td>RoW (13.7m units in 2019)</td>
<td>-9.6%</td>
<td>-31.2%</td>
<td>24.5%</td>
<td>8.1% p.a.</td>
</tr>
<tr>
<td>World (88.9m units in 2019)</td>
<td>-5.6%</td>
<td>-19.4%</td>
<td>13.2%</td>
<td>3.8% p.a.</td>
</tr>
</tbody>
</table>

Source: Based on or includes content supplied by IHS Markit, Automotive Group: Light Vehicle Production Forecast. September 2020.
Electro-mobility
Trends toward electrification of cars remain unchanged; driven by more stringent legal guidelines

**Passenger car CO₂ emission development and regional regulations**

<table>
<thead>
<tr>
<th>Year</th>
<th>US (2026): 108g/km</th>
<th>China (2025): 93.4g/km</th>
<th>EU (2030): 59g/km</th>
</tr>
</thead>
</table>

**CO₂ emission by degree of electrification**

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>CO₂ Emission (g/km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICE</td>
<td>120</td>
</tr>
<tr>
<td>48 V MHEV</td>
<td>102</td>
</tr>
<tr>
<td>FHEV</td>
<td>84</td>
</tr>
<tr>
<td>PHEV</td>
<td>28</td>
</tr>
<tr>
<td>BEV</td>
<td>0</td>
</tr>
<tr>
<td>FCEV</td>
<td>0</td>
</tr>
</tbody>
</table>

- EU continues towards stringent emission standards
- Recently, the governor of California signed an executive order mandating that all new cars to be sold in California from 2035 must be zero-emission vehicles

The longer-term trend towards xEV is unchanged; most likely even accelerating due to incentive programs and green deals.

Car production by fuel type

- xEV penetration: >25% by 2023
- xEV penetration: >50% by 2027

Source: Based on or includes content supplied by IHS Markit, Automotive Group: *Alternative propulsion forecast*. July 2020.
The incremental content of power semiconductors in xEV is a significant opportunity for Infineon

2020 average xEV semiconductor content by degree of electrification

<table>
<thead>
<tr>
<th>2020</th>
<th>Non-Powertrain*</th>
<th>ICE Powertrain</th>
<th>xEV Power**</th>
<th>xEV MCUs</th>
<th>xEV Sensors</th>
<th>xEV Others**</th>
<th>Total semi BoM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>$396</td>
<td>$61</td>
<td>$7</td>
<td>$17</td>
<td>$90</td>
<td>$0</td>
<td>$572</td>
</tr>
<tr>
<td>2022</td>
<td>$396</td>
<td>$38</td>
<td>$14</td>
<td>$23</td>
<td>$330</td>
<td>$32</td>
<td>$834</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2020</th>
<th>2.1m vehicles</th>
<th>5.8m vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>5.8m vehicles</td>
<td>12.2m vehicles</td>
</tr>
<tr>
<td>2025</td>
<td>18.8m vehicles</td>
<td>21.0m vehicles</td>
</tr>
<tr>
<td>2030</td>
<td>27.3m vehicles</td>
<td>32.0m vehicles</td>
</tr>
</tbody>
</table>

* Non-Powertrain: average semiconductor content in body, chassis, safety and infotainment application segments
** "power" includes voltage regulators and ASIC; "others" include opto, small signal discretes, memory

Source: Infineon; based on or includes content supplied by IHS Markit, Automotive Group: Alternative Propulsion Forecast, July 2020; Strategy Analytics: Automotive Semiconductor Demand Forecast 2018-2027 and Automotive Sensor Demand 2018-2027, July 2020

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Infineon offers full system solutions addressing all xEV segments: pure EV and all types of hybrid EVs

Infineon offers full portfolio for the control loop of an electric car

- **Sensors**
  - rotor position sensor
  - current sensor
  - ...and more

- **Microcontrollers**
  - AURIX™

- **Drivers**
  - high-voltage EiceDRIVER™
  - driver ICs

- **Power semis**
  - SiC and IGBT
    - for high-voltage battery electric vehicles, plug-in and full hybrids
  - MOSFETs
    - for 48 V mild hybrids
  - bare-die
  - discretes
  - modules
  - chip embedding

- **Power supply and communication**
  - OPTIREG™
  - board network transceivers

...and more

AURIX™

EiceDRIVER™

Power semis

OPTIREG™

board network transceivers

2020-10-05

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Key package innovations complement Infineon’s leading position in chip technologies for 48 V systems

Key package innovations driving growth for the xEV business

<table>
<thead>
<tr>
<th>Technology</th>
<th>Power chip embedding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top-side cooling package</td>
<td></td>
</tr>
<tr>
<td>MOSFET soldered traditionally on the PCB but more efficient cooling from the top</td>
<td>Chip embedding technology (jointly with Schweizer Electronic): Infineon MOSFET integrated within the PCB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer benefits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Significantly improved thermal management</td>
<td>Increase of power density, energy efficiency and reliability: up to 60% performance improvement compared to traditionally designed system</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Success</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Major European tier-1 awarded Infineon with a triple-digit million Euro design-win</td>
<td>Vitesco first player to adopt the technology</td>
</tr>
</tbody>
</table>
Besides main inverter and on-board charger, battery management is a good example for Infineon’s system solution competence.

Infineon offers basically all components of a complete battery management system (BMS):

- **PMIC**
- **CAN transceiver**
- **MCU**
- **F-RAM**
- **power switching**

**Wireless connection**
- **IC #1**
- **IC #2**
- **IC #3**
- **IC #4**

**Pressure sensor**
- **IC #5**
- **IC #6**
- **IC #7**
- **IC #8**

**Gas sensor**
- **Current sensor**

- **Multi-channel battery monitoring and balancing system ICs** covering cell charge balancing, cell voltage and temperature measurement
- **Wireless control ICs**
- **PMIC**
- **CAN transceivers for robust communication between cells and battery main controller**
- **MCU with scalable processing performance, connectivity and embedded hardware security**
- **F-RAM for data logging and mission profile**
- **High-voltage power MOSFET replacing relay and pyro fuse**
- **Low-power pressure sensors**
- **Gas sensor (H₂ or HCO₃⁻)**
- **Current sensor; type depending on cell topology**
- **Trusted security solutions to support battery identification, functional safety and IP protection**
- **Embedded motor control ICs for various motor types**
- **Standard power MOSFETs**

**Total BoM for 48 V BMS:** $30 – $70
**Total BoM for high-voltage BMS:** $50 – $160

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To meet best cost-performance ratio in xEV drivetrain, IGBT and SiC technologies will co-exist

Selected examples of IGBT versus SiC

Example: All-wheel drive BEV

Axle 1
- Range: SiC
- Large battery: SiC
- Small battery: IGBT

Focus on:
- Cost

Axle 2
- Focus on cost only: IGBT

Example: Axle split PHEV

Axle 1
- Focus on cost only: IGBT

Axle 2
- Focus on range: Internal Combustion Engine

Technology and market development

Choice of power semiconductor technology in main inverter
- More and more OEMs are considering SiC as an alternative to IGBTs
- OEMs’ choice of main inverter technology depends on the choice of
  - range versus cost, and
  - size/cost of the battery

Market development
- Higher-volume platforms to be launched in ~2025 are being awarded over the next quarters
- To address range anxiety, OEMs shift focus to sufficient reach (for mid- to high-end cars preferably)
- To improve their CO₂ footprint online retailers need to operate fully electrified delivery vehicles

Source: Infineon
When OEMs will introduce SiC-based car models to increase their fleet offering, Infineon can leverage its huge IGBT customer base.

Infineon offers a seamless and cost-effective upgrade path across the entire power range:

- **100 – 150 kW**: IGBT
- **150 – 200 kW**: higher-power IGBT
- **> 200 kW**: SiC

**Scalability:**
- Same package for all power ranges
- Same driver ICs for all power ranges

**Si IGBT-based HybridPACK™**

**Si IGBT-based HybridPACK™**

**SiC MOSFET-based CoolSiC™ HybridPACK™**

**EiceDRIVER™ family**
Infineon has an excellent position to win upcoming SiC-based xEV platforms

### Infineon’s leverage in SiC

<table>
<thead>
<tr>
<th>Technology leverage</th>
<th>Infineon is addressing the xEV market with its growing portfolio of SiC-based components optimized for automotive applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leverage of customer base</td>
<td>Infineon’s large IGBT customer base is an essential asset for the transition to SiC</td>
</tr>
</tbody>
</table>
| Scalability | Scalable portfolio of Infineon allows for easy and seamless upgrade from IGBT-based inverters to SiC-based inverters  
Existing customers can beef-up their platform performance while sticking to the same module form factor |
Automated Driving
The growth of L1/L2/L2+ is the main driver of ADAS semi content until 2030; low near-term impact from L3/L4/L5

Source: Strategy Analytics: Metrix Live. December 2019; L2 includes L2 and L2+

Car production by degree of automation

<table>
<thead>
<tr>
<th>Year</th>
<th>Level 0</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>89%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
<td>52%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td></td>
<td></td>
<td>26%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td></td>
<td></td>
<td>28%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2035</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Radar/Lidar modules and sensor fusion will grab the lion’s share of semiconductor BoM in ADAS/AD-equipped cars

**Incremental average semiconductor content per car by level of automation at the given years**

<table>
<thead>
<tr>
<th>Level 2</th>
<th>Level 2+</th>
<th>Level 4/L5</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2 vehicles in 2020: ~5m</td>
<td>L2+ in 2025: ~2.5m</td>
<td>L4/L5 vehicles in 2030: ~2.5m</td>
</tr>
<tr>
<td><strong>Bill-of-materials</strong></td>
<td><strong>$160 - $180</strong></td>
<td><strong>$280 - $350</strong></td>
</tr>
<tr>
<td><strong>Camera modules</strong></td>
<td>40 - 50% of BoM</td>
<td>40 - 50% of BoM</td>
</tr>
<tr>
<td><strong>Radar &amp; Lidar modules</strong></td>
<td>~30%</td>
<td>~30%</td>
</tr>
<tr>
<td><strong>Sensor fusion</strong></td>
<td>20 - 30%</td>
<td>20 - 30%</td>
</tr>
<tr>
<td>Others (e.g. actuators)</td>
<td>5 - 10%</td>
<td>5 - 10%</td>
</tr>
</tbody>
</table>

BoM contains all type of semiconductors (e.g. radar modules include µC); sensor fusion does not include memory.
BoM are projected figures for the respective time frame.
Infineon will roughly double its BoM content in upcoming high-volume radar systems by offering an optimized system portfolio.

### Infineon's increasing offering in 77 GHz radar system solutions

<table>
<thead>
<tr>
<th>Past</th>
<th>Current</th>
<th>Upcoming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radar sensor (SiGe)</td>
<td>Radar sensor (SiGe)</td>
<td>AURIX™ 2G (2nd gen) Microcontroller</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Radar sensor (28nm CMOS, SiGe)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2019 automotive radar sensor IC market (77 / 24 GHz)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infineon</td>
<td>53.3%</td>
</tr>
<tr>
<td>NXP</td>
<td>24.6%</td>
</tr>
<tr>
<td>STMicro</td>
<td>8.3%</td>
</tr>
<tr>
<td>UMS</td>
<td>7.7%</td>
</tr>
<tr>
<td>Denso</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

- Dedicated AURIX™ microcontrollers with hardware-coded radar signal preprocessing will roughly double Infineon’s semiconductor content.
- System-level offering combining radar sensor ICs, micro-controllers and power supply.
- Major advantages for customers:
  - interoperability
  - shorter development time
  - faster time-to-market

Higher levels of automated driving require trust via solutions that one can depend on.

The need for dependable systems per degree of automation

Increasing degree of automation...

- Level 0: No System
- Level 1: Feet-off
- Level 2: Hands-off
- Level 3: Eyes-off
- Level 4: Brains-off
- Level 5: No Driver

...requires dependable systems

- Dependable Sensing
- Dependable Computing
- Secure Communication
- Dependable Actuation
- Dependable Power Supply
- Dependable Memory

= Infineon’s field of competence

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The need for dependability will drive demand for semiconductors; example: intelligent power switches

**Example: Power distribution architecture in a car by degree of automation**

<table>
<thead>
<tr>
<th>Level 2</th>
<th>Level 2+</th>
<th>Level 3</th>
<th>Level 4/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today’s reference architecture</td>
<td>Dedicated protected branches for critical loads</td>
<td>Redundancy for critical loads</td>
<td>Sophisticated “dependability” concept</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2+</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedicated protected branches for critical loads</td>
<td>Redundancy for critical loads</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sophisticated “dependability” concept</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of intelligent power switches</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x</td>
</tr>
<tr>
<td>1.3x</td>
</tr>
<tr>
<td>2x</td>
</tr>
<tr>
<td>&gt;3x</td>
</tr>
</tbody>
</table>

Source: Infineon

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Infineon’s NOR Flash business is another beneficiary of the need for dependability

Structural growth drivers for NOR Flash in general

› increasing system complexity drives demand for higher off-chip code storage
› growing number of applications based on high-performance processing units:
  › code and parameter storage for MCUs, GPUs, MPUs, and other SoCs
  › configuration data for FPGAs

Infineon’s unique offering: Semper™ Secure NOR Flash

› Infineon Semper™ Secure NOR Flash is the first memory solution to combine security and functional safety in a single NOR Flash device
› Infineon Semper™ Secure NOR Flash delivers the security, safety, and reliability required for the most advanced connected automotive systems

Automotive applications of NOR Flash

› ADAS/AD
› instrument clusters
› navigation systems
› Software-over-the-air (SOTA) updates
The Infineon AURIX™ µC family has become the first-choice automotive architecture for high-growth and safety-critical applications.

Infineon AURIX™ revenue development over time

**FY10**
- **TAM:** €1.6bn
- **CAGR** \(\text{FY10-FY25}\) = 11.5%
- *powertrain*: ICE engine management, ICE transmission, xEV motor control
- *classical safety*: power steering, braking, airbag

**FY20e**
- **TAM:** €4.8bn
- **CAGR** \(\text{FY20-FY25}\) = 50%
- *ADAS/AD*: camera host control, sensor fusion host control, radar signal pre-processing

**FY25e**
- **CAGR** \(\text{FY20-FY25}\) = 34%
- *domain and zone control*: drive domain, body & convenience domain, zone control

[Indexed: FY10 = 100]

Strong microcontroller footprint in next-generation high-volume platforms

**OEM platform #1:**
- 14 MCUs (+ NOR Flash + Wi-Fi)
- Start of production: end of CY20

<table>
<thead>
<tr>
<th>Component</th>
<th>Microcontroller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine control module</td>
<td>AURIX™ TC38x</td>
</tr>
<tr>
<td>Braking</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>AD fusion standard</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>AD fusion high-end</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>Instrument cluster</td>
<td>NOR Flash S26KS512</td>
</tr>
<tr>
<td>Infotainment module</td>
<td>89359 (Wi-Fi / Bluetooth)</td>
</tr>
<tr>
<td>Central AD decision module</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>Secure gateway module</td>
<td>AURIX™ TC39x</td>
</tr>
</tbody>
</table>

**OEM platform #2:**
- 20 MCUs
- Start of production: CY22

<table>
<thead>
<tr>
<th>Component</th>
<th>Microcontroller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine management</td>
<td>AURIX™ TC38x</td>
</tr>
<tr>
<td>Braking</td>
<td>AURIX™ TC38x</td>
</tr>
<tr>
<td>AD fusion standard</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>Diesel engine management</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>Airbag</td>
<td>AURIX™ TC37x</td>
</tr>
<tr>
<td>AD fusion high-end</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>Transmission control module</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>Electric power steering</td>
<td>AURIX™ TC36x</td>
</tr>
<tr>
<td>Front camera</td>
<td>AURIX™ TC37x</td>
</tr>
<tr>
<td>Inverter PHEV</td>
<td>AURIX™ TC38x</td>
</tr>
<tr>
<td>Suspension CVC</td>
<td>AURIX™ TC38x</td>
</tr>
<tr>
<td>Radar domain processing</td>
<td>AURIX™ TC39x</td>
</tr>
<tr>
<td>Door module</td>
<td>FR MB91520</td>
</tr>
<tr>
<td>Alarm system module</td>
<td>FR MB91F520</td>
</tr>
<tr>
<td>Digital instrument cluster</td>
<td>Traveo I S6J332</td>
</tr>
<tr>
<td>Head light module</td>
<td>FR MB91F525</td>
</tr>
</tbody>
</table>

Infineon heritage | Cypress heritage
In 2021, the automotive market is expected to snap back

Growth of xEV is accelerated by incentive programs and green deals

Infineon is very well positioned to win upcoming SiC-based xEV platforms:
- due to its scalable product offering
- by leveraging its huge IGBT customer base

For ADAS/AD, dependability is a must and is a key driver of semiconductor content growth

Infineon offers an unmatched portfolio for dependable systems

AURIX™ has become the first-choice microcontroller for high-growth applications
Part of your life. Part of tomorrow.
## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC-DC</td>
<td>alternating current - direct current</td>
</tr>
<tr>
<td>AD</td>
<td>automated driving</td>
</tr>
<tr>
<td>ADAS</td>
<td>advanced driver assistance system</td>
</tr>
<tr>
<td>BEV</td>
<td>battery electric vehicle</td>
</tr>
<tr>
<td>BMS</td>
<td>battery management system</td>
</tr>
<tr>
<td>BoM</td>
<td>bill of material</td>
</tr>
<tr>
<td>CAN</td>
<td>controller area network</td>
</tr>
<tr>
<td>CMOS</td>
<td>complementary metal-oxid semiconductor</td>
</tr>
<tr>
<td>CPU</td>
<td>central processing unit</td>
</tr>
<tr>
<td>CVC</td>
<td>California vehicle code</td>
</tr>
<tr>
<td>DC-DC</td>
<td>direct current - direct current</td>
</tr>
<tr>
<td>ECU</td>
<td>electronic control unit</td>
</tr>
<tr>
<td>EPS</td>
<td>electric power steering</td>
</tr>
<tr>
<td>EV</td>
<td>electric vehicle</td>
</tr>
<tr>
<td>FCEV</td>
<td>fuel cell electric vehicle</td>
</tr>
<tr>
<td>FHEV</td>
<td>full-hybrid electric vehicle</td>
</tr>
<tr>
<td>FPGA</td>
<td>field programmable gate array</td>
</tr>
<tr>
<td>GaN</td>
<td>gallium nitride</td>
</tr>
<tr>
<td>GPU</td>
<td>graphics processing unit</td>
</tr>
<tr>
<td>HSM</td>
<td>hardware security module</td>
</tr>
<tr>
<td>HV</td>
<td>high-voltage</td>
</tr>
<tr>
<td>HW</td>
<td>hardware</td>
</tr>
<tr>
<td>IC</td>
<td>integrated circuit</td>
</tr>
<tr>
<td>ICE</td>
<td>internal combustion engine</td>
</tr>
<tr>
<td>IGBT</td>
<td>insulated gate bipolar transistor</td>
</tr>
<tr>
<td>IVN</td>
<td>in-vehicle networking</td>
</tr>
<tr>
<td>MCU</td>
<td>microcontroller unit</td>
</tr>
<tr>
<td>µC</td>
<td>microcontroller</td>
</tr>
<tr>
<td>MHEV</td>
<td>mild-hybrid electric vehicle; vehicles using start-stop systems, recuperation, DC-DC conversion, e-motor</td>
</tr>
<tr>
<td>micro-hybrid</td>
<td>vehicles using start-stop systems and limited recuperation</td>
</tr>
<tr>
<td>MHEV</td>
<td>mild-hybrid vehicles using start-stop systems, recuperation, DC-DC conversion, e-motor</td>
</tr>
<tr>
<td>MOSFET</td>
<td>metal-oxide silicon field-effect transistor</td>
</tr>
<tr>
<td>MPU</td>
<td>microprocessor unit</td>
</tr>
<tr>
<td>NEDC</td>
<td>new European drive cycle</td>
</tr>
<tr>
<td>OBC</td>
<td>on-board charger</td>
</tr>
<tr>
<td>OEM</td>
<td>original equipment manufacturer</td>
</tr>
<tr>
<td>PCB</td>
<td>printed circuit board</td>
</tr>
<tr>
<td>PHEV</td>
<td>plug-in hybrid electric vehicle</td>
</tr>
<tr>
<td>PMIC</td>
<td>power management IC</td>
</tr>
<tr>
<td>PT</td>
<td>powertrain</td>
</tr>
<tr>
<td>RF</td>
<td>radio frequency</td>
</tr>
<tr>
<td>RoW</td>
<td>rest of world</td>
</tr>
<tr>
<td>Si</td>
<td>silicon</td>
</tr>
<tr>
<td>SiC</td>
<td>silicon carbide</td>
</tr>
<tr>
<td>SiGe</td>
<td>silicon germanium</td>
</tr>
<tr>
<td>SoC</td>
<td>system-on-chip</td>
</tr>
<tr>
<td>SOTA</td>
<td>software over-the-air</td>
</tr>
<tr>
<td>SW</td>
<td>software</td>
</tr>
<tr>
<td>TAM</td>
<td>total addressable market</td>
</tr>
<tr>
<td>ToF</td>
<td>time-of-flight</td>
</tr>
<tr>
<td>V2X</td>
<td>vehicle-to-everything communication</td>
</tr>
<tr>
<td>xEV</td>
<td>all degrees of vehicle electrification (EV, FHEV, HEV, PHEV)</td>
</tr>
</tbody>
</table>
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Peter Schiefer
Division President Automotive

» since 2016: Division President Automotive
» Sep 2012: Head of Infineon worldwide Operations, responsible for chip production, assembly and testing, as well as process technology development, supply chain and purchasing
» Jan 2012: Division President Power Management & Multimarket
» since 2018: Member and Vice Chairman of the Board of Directors of the JV SIAPM (SAIC Infineon Automotive Power Modules (Shanghai) Co. Ltd.)
» 2013 – 2016: Member of the Supervisory Board of Infineon Technologies Austria
» since 2012: Member of the Supervisory Board of Infineon Technologies Dresden

Peter Schiefer was born in Munich, Germany, in 1965. He holds a Diploma in Electrical Engineering from the University of Applied Sciences in Munich.
He joined Infineon (Siemens AG until 1999) in 1990.