Infineon Functional Safety
Megatrends shaping the automotive market
Infineon products are enabling automotive safety

- Automated Driving
  - Enabling safety towards Vision Zero
  - ISO 26262

- Electro-Mobility
  - Enabling CO₂ reduction

- Connectivity
  - Enabling the communication of cars

- Security
  - Enabling security in connected cars

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We simplify the integration of safety features

**Mission:** We shape the future of mobility with microelectronics enabling clean, safe, smart cars.

- ISO26262-compliant
- ISO26262-ready

Infineon electronics are a foundation for safe and autonomous driving customers can trust in
Trust requires dependable systems which are always available
Infineon supports with safe semiconductors

Our profound system understanding makes us a competent partner in safety-critical applications providing safe semiconductors in conformance to ISO26262
Dependable systems are highly available, safe and secure systems, increasing the need for more dependable electronics.

<table>
<thead>
<tr>
<th>Fail-Safe</th>
<th>Fail-Operational</th>
<th>High Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>in the event of a failure, system enters safe state</td>
<td>Mitigate potentially hazardous effects by ensuring critical operations in the event of a failure</td>
<td>Ensure high availability beyond critical operations; a safe and secure system, that operates in all conditions</td>
</tr>
</tbody>
</table>

### Yesterday (operating time until failure)

- **Sense**
  - Integrated safety and diagnostic functions
- **Compute**
  - Safe computing supported by safety library
- **Act**
  - Gate drivers and switches supporting safety applications
- **Supply Distribute**
  - Safe supplies for microcontrollers and switches for relays and fuse replacement

### Today (operating time after failure)

- **Sense**
  - Broad ISO26262 compliant product portfolio, incl. dual die products to provide redundancy
- **Compute**
  - First microcontroller certified acc. ISO26262:2018 with increased built in diagnostics.
- **Act**
  - Gate drivers and switches ProSIL(TM) ISO26262-compliant
- **Supply Distribute**
  - ISO26262-compliant PMICs and ISO26262-ready switches for relays and fuse replacement

### Tomorrow (extended operating time after failure)

- **Sense**
  - Measurement diversity coming from multiple technologies
- **Compute**
  - Increased performance through integrated accelerators with holistic safety
- **Act**
  - Drivers and switches with functions dedicated for DC/DC / Battery Management
- **Supply Distribute**
  - ISO26262-compliant application specific PMICs and switches for fail operational power supplies
From Safety Goals (SG) to Top Level Safety Requirements (TLSR)
The “Infineon Safety Investigation“ a supporting process

Safety investigation  → Support to the Development process

Hazard analysis & risk assessment
Specification of Safety Goals

Functional safety concept
Specification of functional safety requirements

Technical safety concept
Specification of technical safety requirements

Hardware safety concept
Software safety concept

Hardware safety requirements
Software safety requirements

How?

OEM
Tier 1

Classical Approach

Safety Application Community

Application and Concept Engineering

Product Development

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The product Top Level Safety Requirements (TLSR) are derived from the “Safety Investigation"
The Holistic Functional Safety approach of Infineon
A foundation for dependable electronics

Management of FuSa
An established culture of safety builds trust in Infineon products, documented in a safety policy

Development
Proprietary development processes conforming with ISO26262 by ensured compliance concepts

Safety Analyses
Well established safety analyses incl. Infineon tools provide evidence to fulfill the required safety

Production
Infineon’s automotive specific production of top quality products increases availability

Foundation for safe and dependable electronics

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With our strong Functional Safety experience we provide building blocks for integrating safety features

**ProSIL™ products support a safety use case**

<table>
<thead>
<tr>
<th>Customer use case</th>
<th>System Integration Efforts</th>
<th>System Integration Documentation</th>
<th>Safety Feature Description</th>
<th>Infineon Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design with safety product to develop its own safety system</td>
<td>Use case specific</td>
<td>Use case specific</td>
<td>Product with diagnostic or safety features</td>
<td></td>
</tr>
<tr>
<td>Hardware integration using products developed with Infineon automotive processes</td>
<td>Medium</td>
<td>Safety App. Note</td>
<td>Safety analyses and customer documentation supporting ISO26262 system integrations</td>
<td>ISO 26262 ready</td>
</tr>
<tr>
<td>System designed around Infineon components developed specifically for safety relevant applications</td>
<td>Low</td>
<td>Safety Manual</td>
<td>Product developed according to ISO26262 process with required documentation</td>
<td>ISO 26262 compliant</td>
</tr>
</tbody>
</table>

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/* Example 1: Commenting the end of following if is not necessary as there are no additional statement blocks inside */

if (DevErrorCount == 0) {
    DevErrorCount += Fr_lDetCheckInvalidLPduIdx(Fr_LPduIdx, FR_SID_TRANSMITTXLPDU);
}

/***********************************************************/
/* Example 2: Commenting the end of following if is required as it contains an 'if' statement block inside */

if (DevErrorCount == 0) {
    /* FR228 (2): FR_E_INV_LPDU_IDX if its a transmit LPDU */
    if (CfgPtr - WRHS1.B.Cfg == 1U) {
        Det_ReportError(FR_MODULE_ID, FR_INSTANCE_ID, FR_SID_RECEIVERXLPDU, FR_E_INV_LPDU_IDX);
        DevErrorCount++ ;
    } /* End of "if (CfgPtr - WRHS1.B.Cfg == 1U)" */
} /* End of "if (DevErrorCount == 0)" */

/***************************************************************
/* Example 3: Commenting the end of following if is required as it contains a 'for' statement block inside */

/* Example 1: Commenting the end of following if is not necessary as there are no additional statement blocks inside */
/* Example 2: Commenting the end of following if is required as it contains an 'if' statement block inside */
/* Example 3: Commenting the end of following if is required as it contains a 'for' statement block inside */

Infineon supports the complete safety lifecycle
Your trusted Supplier

ISO26262

Conformity to ISO26262 by internal Functional Safety confirmations supported by ensured compliance processes

Comprehensive documentation supports customer requests and simplifies integration

Robust safety designs are optimized for safety-critical automotive applications

Global support by application safety experts and product safety engineers in development and field support

From prototyping and developer kits to SW drivers, a comprehensive FuSa ecosystem can be provided

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Experienced Functional Safety semiconductor supplier with comprehensive system understanding supports complete safety lifecycle

Your #1 partner in Safe Systems
Infineon components support your safety requirements and are easy to integrate

Automated Driving enabled by dependable electronics from Infineon based on our comprehensive system understanding to support all safety-relevant automotive systems

Certified Products
Project Launch Support
Quick Start & Prototyping
Trouble shooting
Training
In Field Maintenance
Infineon is your trusted partner for Functional Safety
Committed to enable dependable solutions

Mission: We shape the future of mobility with microelectronics enabling clean, safe, smart cars.

› The emphasis on safety at Infineon, enables us to develop and provide products for the automotive market, for all safety-relevant applications
› With our passion for innovation and quality, we develop products for the growing Functional Safety market
› In an ever-changing automotive market, Infineon Pro-SIL™ products enable safety-relevant systems to achieve their safety goals
Part of your life. Part of tomorrow.
For more information click on the respective image below.