ROHM
SEMICONDUCTOR

Meeting Next-Generation Standards with ROHM's Functional Safety

ComfySIL
Functional Safety

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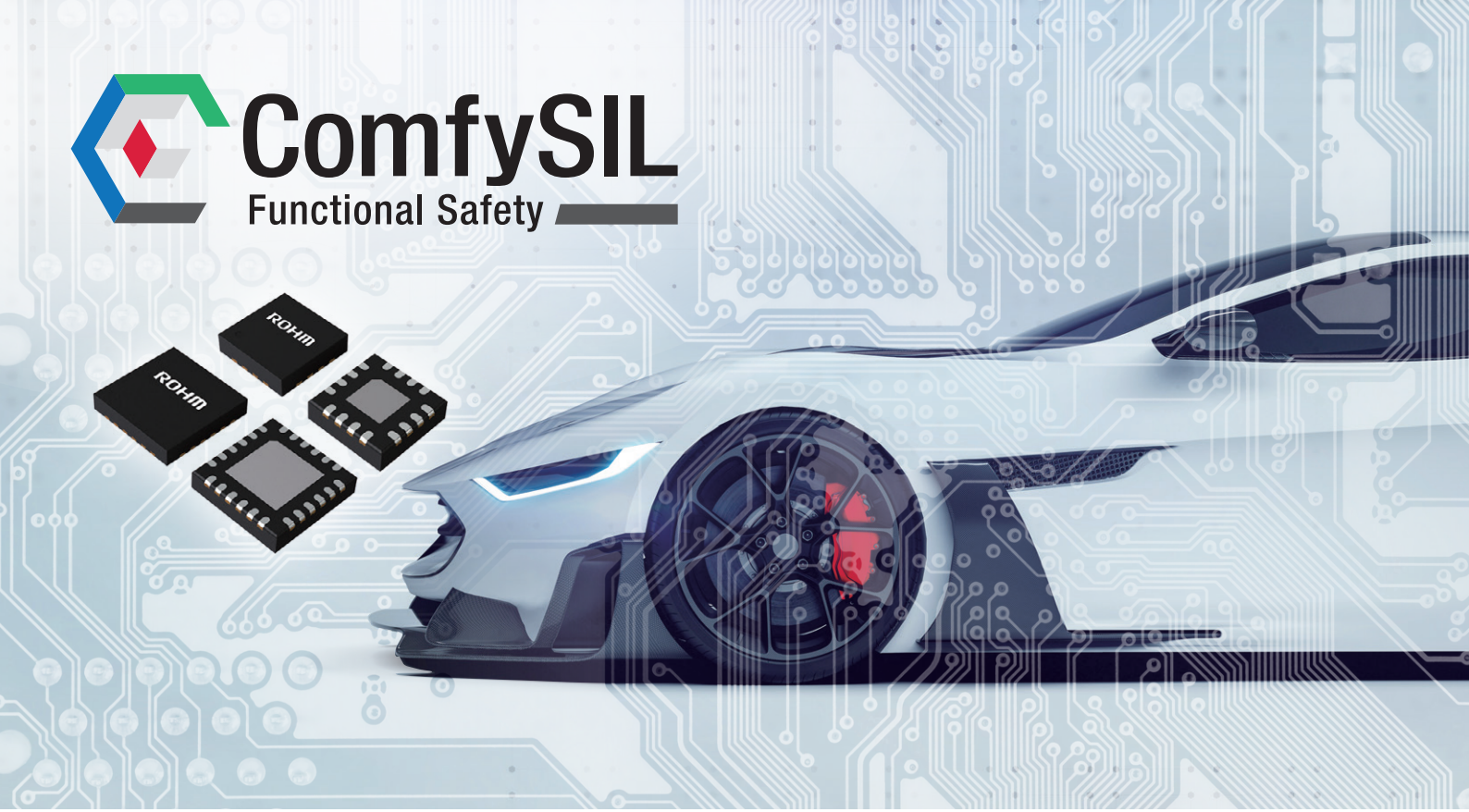


Pursuing Overall System Safety

Greater safety is required as electronic circuits are increasingly being used for system control in fields such as transportation, industrial equipment and medical devices.
ROHM has established a development and production system compliant with various quality and safety standards that allow us to work together with customers to improve product safety while promoting business activities in line with our corporate objective of ‘Quality First’.

ROHM Automotive Product Initiatives

ROHM provides reliable traceability and an optimized supply chain by adopting a vertically integrated production system within the group that infuses superior quality into every process, from development to manufacturing.
We have built a dedicated line for automotive products and carry out development that complies with quality management system (IATF 16949) and electronic component reliability (AEC-Q100/101/102) standards.
In 2015 we began establishing an ISO 26262 process to address functional safety, and in March 2018 acquired ISO 26262 development process certification from 3rd party certification body TÜV Rheinland.
What’s more, as the functional safety requirements for semiconductors continue to increase and a new chapter on semiconductor components was added to the ISO 26262 2nd Edition in December 2018, we are actively working to improve vehicle safety.


Certificate

Functional Safety Management

ROHM

TÜVRheinland®
Precisely Right.

ISO 26262 Process Certificate

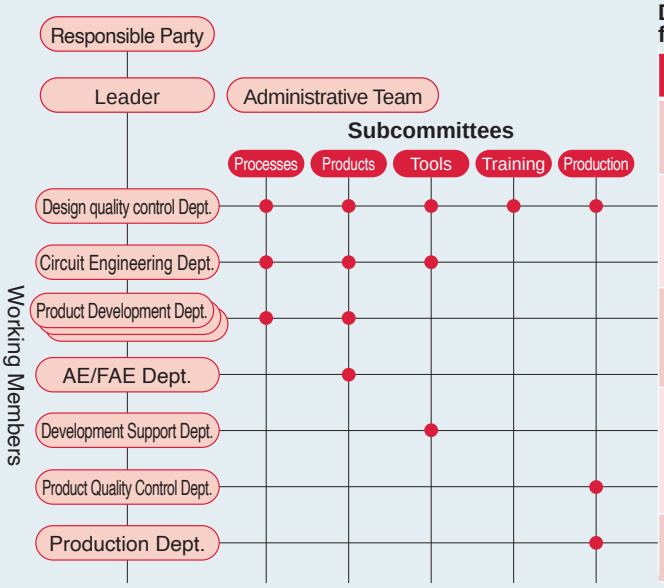
Launching the ComfySIL™ brand for functional safety

ROHM launched the ComfySIL™ brand to enable customers involved in the design of functional safety to use products that support SIL (Safety Integrity Level) in a ‘Comfy’ (comfortable) manner, allowing ROHM to contribute to the greater safety, security, and convenience of social systems.
ComfySIL™ is awarded to products that conform to the ComfySIL™ concept for functional safety in the industrial equipment and automotive markets.

ComfySIL
Functional Safety

ISO 26262 Framework

ROHM began building ISO 26262 processes to support functional safety in 2015. In addition to full-time employees who have acquired TÜV Rheinland global common certification, cross-sectional activities are carried out through 5 subcommittees in multiple departments (i.e. Design quality control Dept., Circuit Engineering Dept., Product Development Dept., AE/FAE Dept., Development Support Dept.).



Divided into subcommittees to carry out activities required for standards compliance

Subcommittees	Activity Overview	Main Activities
Process Subcommittee	Process management	·Process management/policy making ·SER(Soft Error Rate) survey
Product Subcommittee	Work product creation	·FIT/FMEDA creation flow ·Creating work products ·Acquiring Functional Safety Engineer (FSE) qualification
Tool Subcommittee	Tool management	·Certification and management of existing tools ·Introduction, review, and management of new tools ·Considering Fault Injection Sim
Training Subcommittee	In-house training Acquiring qualifications	·Holding employee study sessions ·Obtaining Functional Safety Manager(FSM) qualification ·Acquiring Functional Safety Engineer(FSE) qualification
Production Subcommittee	Production-related forms	·Creation and management of production-related forms

ISO 26262 Process Compliance Documentation

Various work products must be created and managed to comply with ISO 26262 processes.
The functional safety manager creates and manages each work product, centrally managing all products in a database to provide customer support.

ISO 26262 Process Compliance Documentation

2 Management:	12 types
4 System:	11 types
5 Hardware:	14 types
6 Software:	17 types
7 Production:	13 types
8 Supporting Processes:	27 types
9 ASIL:	7 types

ISO 26262 Process Document List

2.Management
- Organization-specific rules and processes for functional safety
- Evidence of competence management
- Evidence of quality management
- Identified safety anomaly reports
- Impact analysis at the item level
- Impact analysis at element level
- Safety plan
- Project planning
- Safety case
- Functional safety assessment plan
- Confirmation measure reports
- Evidence of safety management regarding production, operation, service and decommissioning

3.Concept
- Item definition
- Hazard analysis and risk assessment report
- Verification report of the hazard analysis and risk assessment
- Functional safety concept
- Verification report of the functional safety concept

4.System
- Technical safety requirements specification
- Technical safety concept(a)
- System architectural design specification(b)
- Hardware-software interface specification(c)
- Specification of requirements for production, operation, service and decommissioning (d)
- Verification report of the 4 deliverables listed in (a) to (d) above
- Safety analysis reports
- Integration and test strategy
- Integration and test report
- Safety validation specification
- Safety validation report

7.Production
- Safety-related content of the production plan
- Safety-related content of the production control plan
- Productibility requirements specification
- Production process capability report
- Safety-related content of the service plan
- Safety-related content of the service instructions
- Safety-related content of the information made available to the user
- Safety-related content of the decommissioning instructions
- Operation, service and decommissioning requirements specification
- Safety-related content of rescue service instructions
- Control measures report
- Production process capability report
- Field observation instructions

12.Motorcycles
- Hazard analysis and risk assessment report
- Verification report of the hazard analysis and risk assessment
- Safety validation specification including safety validation environment description
- Safety verification report

5.Hardware
- Hardware safety requirements specification
- Hardware-software interface specification (refined)
- Hardware safety requirements verification report
- Hardware design specification
- Hardware safety analysis report
- Hardware design verification report
- Specification of requirements for production, operation, service and decommissioning
- Analysis of the effectiveness of the architecture of the item to cope with the random hardware failures
- Verification review report of evaluation of the effectiveness of the architecture of the item to cope with the random hardware failures
- Analysis of safety goal violations due to random hardware failures
- Specification of dedicated measures for hardware
- Verification review report of evaluation of safety goal violations due to random hardware failures
- Hardware integration and verification specification
- Hardware integration and verification report

6.Software
- Documentation of the software development environment
- Software safety requirements specification
- Hardware-software interface (HSI) specification (refined)
- Software verification report
- Software architectural design specification
- Safety analysis report
- Dependent failures analysis report
- Software verification report
- Software unit design specification
- Software unit implementation
- Software verification specification
- Software verification report (refined)
- Software verification specification (refined)
- Embedded software
- Software verification report (refined)
- Software verification specification (refined)
- Software verification report (refined)

8.Supporting Processes
- Supplier selection report
- Development interface agreement (DIA)
- Supplier's safety plan
- Functional safety assessment report
- Supply agreement
- Configuration management plan
- Change management plan
- Change request
- Impact analysis and change request plan
- Change report
- Verification plan
- Verification specification
- Verification report
- Documentation management plan
- Documentation guideline requirements
- Software tool criteria evaluation report
- Software tool qualification report
- Software component documentation
- Software component qualification report
- Software component qualification report
- Hardware element evaluation plan
- Hardware element test plan
- Hardware element evaluation report for hardware elements
- Description of candidate for proven in use argument
- Proven in use analysis reports
- Base vehicle manufacturer or supplier guideline
- Safety rationale

9.ASIL -oriented and safety-oriented analyses
- Update of architectural information
- Update of ASIL as attribute of safety requirements and elements
- Update of ASIL as attribute of sub-elements
- Dependent failures analysis
- Dependent failures analysis verification report
- Safety analyses
- Safety analyses verification report

ROHM ComfySIL™ Functional Safety Categories and Submittable Documents

Functional Safety Categories

The following are ROHM's functional safety categories(as of October 2021, for the automotive sector only).

- **FS process compliant**
  Indicates that the IC was developed using ISO 26262-compliant processes conforming to the ASIL level.
- **FS mechanism implemented**
  Denotes that the IC is equipped with functional safety required by the ASIL level.
- **FS supportive**
  Indicates the automotive IC is able to support functional analysis related to functional safety.

List of Materials Provided by Category

	FS process compliant	FS mechanism implemented	FS supportive
IATF16949 Process Compliant	✓	✓	✓
ISO 26262 Process Compliant	✓	–	–
FMEA	✓	✓	✓
FIT	✓	✓	✓
FMEDA	✓	✓	✓*
Safety manual	✓	✓	–

*FS supportiveFS supportive FMEDA does not include analysis such as hardware architecture metrics.

Refer to ROHM's website for an explanation of ComfySIL™ along with compatible products.

URL: https://www.rohm.com/functional-safety

ROHM Sales Offices Contact us for further information about the products.

Santa Clara	+1-408-720-1900	United Kingdom	+44-1-908-272400	Hong Kong	+852-2740-6262
Boston	+1-781-565-1138	Finland	+358-400-726 124	Taiwan	+886-2-2500-6956
Detroit	+1-248-348-9920	Spain	+34-9375-24320	Singapore	+65-6436-5100
San Diego	+1-858-625-3600	Hungary	+36-1-950-5859	Philippines	+63-2-8807-6872
Mexico	+52-33-3123-2001	Italy	+39-039-5783432	Thailand	+66-2-254-4890
Germany	+49-2154-921-0	Seoul	+82-2-8182-700	Malaysia	+60-3-7931-8155
Stuttgart	+49-711-7272370	Beijing	+86-10-8525-2483	India	+91-80-4125-0811
Nuremberg	+49-911-810452-26	Shanghai	+86-21-6072-8612	Kyoto	+81-75-365-1077
France	+33 (0) 1 40 60 87 30	Shenzhen	+86-755-8307-3008	Yokohama	+81-45-476-2121

ROHM Co.,Ltd.
21 Saiin Mizosaki-cho, Ukyo-ku,
Kyoto 615-8585 Japan
TEL : +81-75-311-2121 FAX : +81-75-315-0172
www.rohm.com

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