# Silicon Mobility

## **Functional Safety Work Products**

OLEA<sup>®</sup> solution is ISO 26262 certified and ready for critical safe applications



OLEA<sup>®</sup> T222 FPCU ISO 26262 ASIL-D Ready from SGS-TÜV Saar



OLEA<sup>®</sup> COMPOSER & OLEA LIB

ISO 26262 Compliant Certified for the design of safe systems up to ASIL-D from SGS-TÜV Saar



**OLEA<sup>®</sup> APP INVERTER** ISO 26262 ASIL-D Compliant from SGS-TÜV Saar

Silicon Mobility offers a full stack automotive solution that provides a control chip, application software and development environment all certified ISO 26262 for critical safe systems. Safety work products are available for most component describing the Safety Element out of Context (SEooC) methodology used, the safety mechanisms available and usage, and the certification report.

## OLEA<sup>®</sup> FPCU - functional safety features with SILant<sup>®</sup> technology

OLEA<sup>®</sup> FPCU automotive semiconductor solution is designed to process critical information faster with 100% predictability and accuracy. SILant<sup>®</sup> is a patented hardware technology embedded into OLEA<sup>®</sup> FPCU. SIlant<sup>®</sup> integrates a safety architecture that goes beyond ASIL-D SEOOC objectives.

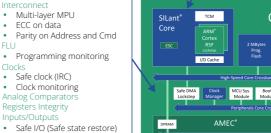
> SILant<sup>®</sup> Core **Execution Unit protections**

> > MPU Cache with ECC

2 clock delay Lock Step

## **Benefits:**

- Safety at application level • with H/W acceleration
- Enables ASIL-D designs
- Saves CPU processing power
- Enables software code simplification
- Shortens the fault reaction handling time interval
- Supports system scalability and reuse
- Saves development efforts from specification to assessment



I/O monitoring with loopback

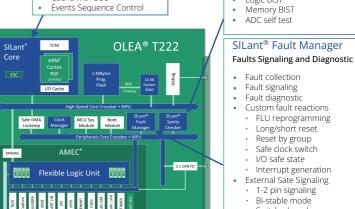
SILant<sup>®</sup> Infrastructure

RAM with SECDED ECC

Flash with SECDED ECC

-chip memory

- I/O supply LVD
- Core supply HVD & LVD
- Temperature monitoring2 x Temperature sensors



Switched mode Fault injection autotest

SILant<sup>®</sup> Sanity Checker

Complete Self Test

Logic BIST

## Methodology:

The FuSa analysis has been established upon four assumptions :

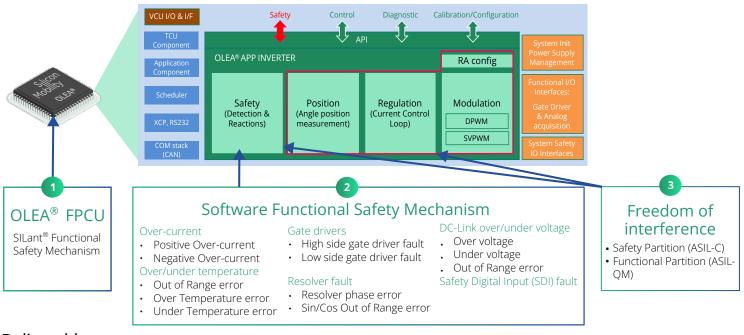
- Automotive traction inverter/e-motor control, DC-DC & OBC
- Safety goals
- Safe states
- External measures

## **Deliverables:**

- Certificate and certification report
- Safety Manual
- FMEDA calculation sheet
- Frrata

## OLEA<sup>®</sup> APP – T222 INVERTER – functional safety features

OLEA<sup>®</sup> APP INVERTER is an application Software for OLEA<sup>®</sup> FPCU enabling best in class control of electrified powertrains. Its functional safety is built upon 3 key elements: the hardware resources of the OLEA<sup>®</sup> FPCU, the software safety mechanisms and the software architecture.



#### **Deliverables:**

- Certificate and certification report
- Safety Manual

- FMEDA calculation sheet
- Errata

## OLEA<sup>®</sup> COMPOSER & OLEA<sup>®</sup> LIB - functional safety scope

OLEA<sup>®</sup> COMPOSER and OLEA<sup>®</sup> LIB are software tools to develop safety-related software and applications up to ASIL-D. The scope of qualification to ISO 26262 includes:

- Our products:
  - OLEA<sup>®</sup> LIB T222 Target
  - OLEA<sup>®</sup> LIB T222 MATH
  - OLEA<sup>®</sup> COMPOSER T222 Target Framework
  - ARM CC compiler
- AGILIS Precision RTL

#### Safety Manual reports:

- The Tool Confidence Level (TCL)
- The qualification test protocols for TCL > TCL1
- The behavior under anomalous operating conditions and associated safety measures
- The assumptions of use

- MathWorks
  - MATLAB
  - Simulink
  - Embedded Coder
  - HDL Coder

#### Deliverables:

- Certificate and certification report
- Safety Manual
- Tool Criteria Evaluation report (TI, TD, TCL)
- Tool Qualification Plan
- Anomalous conditions analysis reports
- Defect Reports

## Safety work products records - available for audit

Silicon Mobility keeps records of comprehensive functional safety related documentations. Among them includes:

- Development process design rules
- Verification specification
- Report verification

- Functional requirement
- Safety requirement
- Dependent Failure Analysis report
- Traceability Matrix

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