IEEE 2851 STANDARDS

FUNCTIONAL SAFETY INTEROPERABILITY

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Executive Summary

- IEEE 2851 family of standards address a known problem related to functional safety interoperability

- IEEE Std 2851-2023 (Standard for Functional Safety Data Format for Interoperability within the Dependability Lifecycle) was published in December 2023 and ready to be referenced by regulatory bodies such as UNECE

  - https://standards.ieee.org/ieee/2851/10780/

- IEEE P2851.1 (Functional Safety interoperability with reliability), is an active PAR in development

  - https://sagroups.ieee.org/2851/

2851-2023 Scope

The standard defines a dependability lifecycle of products with focus on interoperable activities related to functional safety and its interactions with reliability, security, operational safety and time-determinism.

It defines methods, description languages, data models, and databases that have been identified as necessary or critical, to enable the exchange/interoperability of data across all steps of the lifecycle encompassing activities executed at IP, SoC, system and item levels, in a technology independent way across application domains such as automotive, industrial, medical and avionics safety critical systems, and to support developing methodologies such as Artificial Intelligence.

2851 Overview
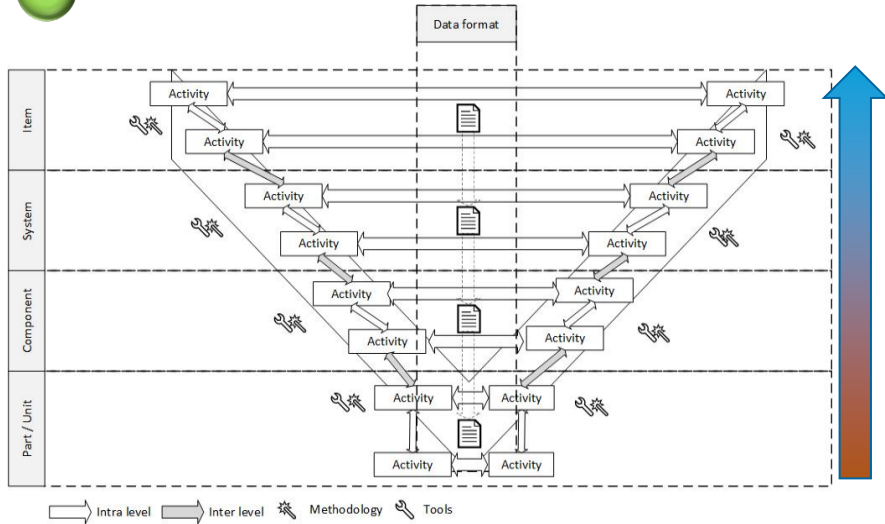
1. Enable unified format for exchange/interoperability for design, analysis and verification activities across the supply chain

2. Align requirements between Functional Safety and other aspects of the dependability life cycle (Performance, Security)

3. Address Functional Safety needs in an industry independent manner, enabling deliverables for all these industries (lower in the supply chain)
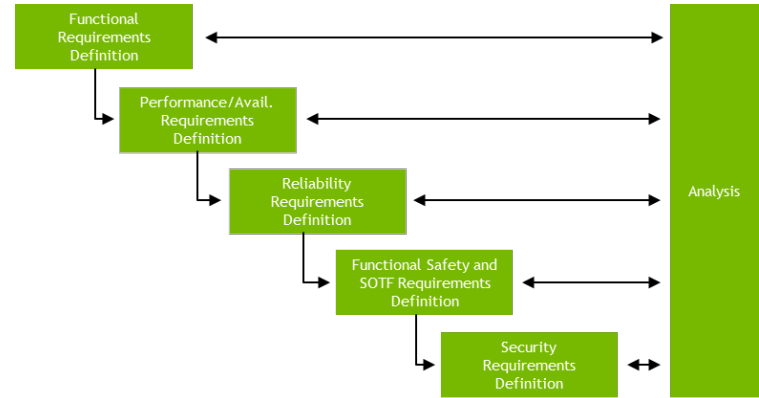
2851 Membership

30 companies (IP/IC providers, EDA vendors, Tier1s and OEMs), **70+** active individuals

Accellera	Hesaitech	Nvidia
AMD	Hitachi	NXP
Analog Devices	Horizon AI	On Semi
ARM	Infineon	Qualcomm
Arteris	Intel	Renesas
Aurora	Iroctech	Resiltech
Bosch	Siemens	SGS-TUV
Cadence	Microsemi	ST Microelectronics
Exida	Micron	Synopsys
Ford	Nutonomy	Texas Instruments

Working Group Officers: Jyotika Athavale, Synopsys (chair), Nir Maor, Qualcomm (vice-chair), Wei-Ren Chen, SGS (secretary)

2851 Family of Standards

P2851 (2023)
Base Standard
Domain Agnostic Dependability Lifecycle

P2851 Rev1
Addition of Annexes for Automotive Functional Safety Interoperability

P2851.1 (2025)
FuSa-Reliability

P2851.2
FuSa-Cybersecurity

P2851.3
FuSa-SOTIF

P2851.4
FuSa-Real Time

P2851.1 PAR Scope

This standard covers implementation guidance for key methods, description languages and database topics identified in the IEEE 2851-2023 standard, related to functional safety and its interactions with reliability, to enable the exchange/interoperability of data.

- In addition, this standard defines an alignment flow of functional safety and reliability in the dependability lifecycle context, as described in IEEE 2851-2023.

Topics include
- Radiation Testing for Soft Errors
- Vulnerability Factors Measurements
- Base Failure Rate Estimation
- System RAS Architecture
- Prognostics Activities

The activities are executed at intellectual property (IP), system-on-chip (SoC), system, and item levels in a technology independent way across application domains.

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Thank You