# Objectives / Purpose

This document describes test specification for NXP SmartTRX Radar Front End software.

# Scope

The scope of this test spec is to cover the test scenarios for the RFE requirements.

The audience consists of Software Architects, Project Manager, Safety Architect, Software Developers, Software Testers and Quality Assurance.

## Overview



# Test Environment and Constraints

## Test Environment

| **Resource** | **Description** | **RFE Test** |
| --- | --- | --- |
| ZeBu Emulation platform for STRX Digital Subsystem (pre-silicon stage) | STRX SoC Digital Subsystem emulation including all the peripherals and tooling to interface to a host (PC) except the RFE Analog IPs. | App-M7 to RFE-M7 communication. ( API calls, Cmd server & IPC )  RFE-M7 Infra IP drivers  Interface testing for Timing Engine, PDC, Packer and BIST DMA. |
| C – Simulation environment  RFE Simulation environment : RFE Analog ( AMS models ), RFE Digital Access & Control | RFE Analog IPs models will be used which runs on PC. | Analog IP drivers, whole RF API functionality, Radar System cycle (Calibration, Frame & BIST)  RFE-M7 Infra IP drivers.  Drivers for Timing Engine, PDC, Packer and BIST DMA. |
| RTL Simulation environment  RFE Simulation environment : RFE Analog ( AMS models ), RFE Digital Access & Control | RFE Analog IPs models will be used which runs on PC. | Analog IP drivers, whole RF API functionality, Radar System cycle (Calibration, Frame & BIST)  RFE-M7 Infra IP drivers.  Drivers for Timing Engine, PDC, Packer and BIST DMA. |
| FPGA Board for digital part of the RFE subsystem (pre-silicon stage) | STRX SoC RFE Digital IPs, RFE Access and RFE control mapped onto an FPGA and tooling to interface to a host (PC). | RFE-M7 Infra IP drivers.  Interface testing for Timing Engine, PDC, Packer and BIST DMA. |
| STRX system reference board (post silicon stage) | System Reference board for STRX IC, including the external on-board peripherals and the tooling to interface to a host (PC) | App-M7 to RFE-M7 communication. ( API calls, Cmd server & IPC )  Analog IP drivers, whole RF API functionality, Radar System cycle (Calibration, Frame & BIST)  RFE-M7 Infra IP drivers.  Drivers for Timing Engine, PDC, Packer and BIST DMA. |
| CSI2 Capturer, GUI Chirp Designer,  MATLAB reference model for data visulaization | TBD |  |
| Lauterbach Trace32 for Debug, image loading | LTB tracer |  |

## Dependencies to other modules

IPCF

Infra Drivers (tbd)

## Known limitations and assumptions

* Analog is simulated.
* FPGA not real-time.
* Zebu simulation accuracy.

# Test Suites Chapter 2.2 Use Cases

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall support Barracuda compatibility radar system cycle executed by radar application on APP-M7.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value and check the response code. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent parameters and check the response code. |
| rfe\_tc\_xxxx | Check RFE frame configuration with valid parameters and check the response code. |
| rfe\_tc\_xxxx | Check RFE IP block Re-calibration app specific parameters and check the response code. |
| rfe\_tc\_xxx | Check RFE frame start parameters and check the response code. |
| rfe\_tc\_xxxx | Check behaviour of RFE BIST parameters and check the response code. |
| rfe\_tc\_xxxx | Raw data is transferred to binary files or streamed to local host on PC and either visualized real-time or analysed offline with default data visualizer. |
| Requirements Tested | [1301084](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2FMB_b99057995d854c1d9c9e42c590d68c8f&componentURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Frm-projects%2F_r8ZsYRVKEeiLn-6Dce4MoA%2Fcomponents%2F_entLQI3hEeqa) |

## Test Suite REF\_TS\_00xx

This test suite is used to check the RFE SW shall execute autonomous radar system cycles executed on RFE-M7. The test suite runs on APP-M7

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value and check the response code. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent parameters and check the response code. |
| rfe\_tc\_xxxx | Check RFE calibrate, frame and BIST configuration with valid parameters and check the response code. |
| rfe\_tc\_xxxx | Check RFE Radar System Cycle start parameters and check the response code. |
| rfe\_tc\_xxxx | Raw data is transferred to binary files or streamed to local host on PC and either visualized real-time or analysed offline with default data visualizer. |
| Requirements Tested | [1301084](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2FMB_b99057995d854c1d9c9e42c590d68c8f&componentURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Frm-projects%2F_r8ZsYRVKEeiLn-6Dce4MoA%2Fcomponents%2F_entLQI3hEeqa) |

# Test Suites Chapter 3 RFE API

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall support RFE Radar Cycle (Use Case) API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE use case API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE use case API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE use case API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280200 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE Safety API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE Safety API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE Safety API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE system API function with equivalence and boundary input configurations. |
| Requirements Tested | 1299516 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE DFE(Streaming) API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE streaming API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE streaming API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE streaming API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280244 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE system API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE system API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280304 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE IP API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE system API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE use case API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280223 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE Register API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE system API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE use case API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280123 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE Validation API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE system API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE use case API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280784 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE DFT API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE system API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE use case API function with equivalence and boundary input configurations. |
| Requirements Tested | 1299517 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE Abstract Compatible API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API with valid parameters and check the return status. |
| rfe\_tc\_xxxx | Check RFE system API with invalid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE use case API function with equivalence and boundary input configurations. |
| Requirements Tested | 1305665 |

## Test Suite RFE\_TS\_00xx

This test suite is to check compile time selection of APIs exposed to a customer.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Test by building using build diversities. Include APIs which are not part of diversity on client build and build should fail. |
| Requirements Tested | 1280269 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE restrict access to the defined API groups and to individual API calls depending on its state.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with invalid value. |
| Rfe\_tc\_xxxx | Check RFE is in initialized state for accepting frame configuration. Check RFE frame configuration with valid parameters and check the response code. |
| Rfe\_tc\_xxxx | Check RFE is in initialized state for accepting calibration of Ips. Check RFE IP block re-calibration and verify the response error code. |
| Rfe\_tc\_xxx | Check RFE is in initialized state for accepting frame start. Check RFE frame start and verify error response code. |
| Rfe\_tc\_xxxx | Check RFE is in initialized state for accepting self tests. Check behaviour of RFE BIST and verify the error response code. |
| Rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| Rfe\_tc\_xxxx | Check RFE frame configuration with invalid parameters. |
| Rfe\_tc\_xxxx | Check RFE is in initialized state and frame configured state for accepting frame start. Check RFE frame start and verify error response code. |
| Requirements Tested | 1280283 |

# Test Suites Chapter 3.1 RFE Radar Use case API

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall support definition of multiple radar use cases.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| Rfe\_tc\_xxxx | Check RFE calibrate, frame and BIST configuration with valid parameters. |
| Rfe\_tc\_xxxx | Check configuring RFE multiple radar use cases using RFE Radar use case api. |
| rfe\_tc\_xxxx | Check RFE IP block Re-calibration app specific |
| rfe\_tc\_xxx | Check RFE frame start |
| Rfe\_tc\_xxx | Check stopping the radar frame acquisition by using RFE Radar use case api and select a different use case and repeat this at certain intervals. |
| rfe\_tc\_xxxx | Raw data is transferred to binary files or streamed to local host on PC and either visualized real-time or analysed offline with default data visualizer. |
| Requirements Tested | [1280188](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_7be8ff4281c34ea1b9f156f37892daf8&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1280524](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_c005e6759f134bc3869b5d356b2e56bb&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1280375](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_40da06a6620642d0ba9e14154420c1e1&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1280242](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_73700f25ed18475bb95d2d50e3d00e78&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1280385](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_a19dd29c7bfe444080fa3f6aea67ae13&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1291046](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2FMB_afc2d8c4467344bc85408aa1a35f0e40&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.), [1280692](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_cfb3a7ad058648c09aef94c2334c5540&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1280639](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_d1d590742bed4ecd9d05a1a5fc1ee739&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1288227](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2FMB_ad1917ed936840039f9e14b8d0d5715d&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.) |

# Test Suites Chapter 3.1.2 Radar Frame

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE API shall support programming maximum of 1024 Chirps.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| Rfe\_tc\_xxxx | Check RFE calibrate, frame and BIST configuration with valid parameters. |
| Rfe\_tc\_xxxx | Check configuring RFE static use cases by programming of < 1024 samples per chirps and verify the response code. |
| Rfe\_tc\_xxxx | Check configuring RFE static use cases by programming of > 1024 samples per chirps and verify the response code. |
| Rfe\_tc\_xxxx | Check configuring RFE static use cases by programming of 1024 samples per chirps and verify the response code. |
|  | Verify at APP-M7 number of interrupts to check the number of chirps programmed correctly. Check the buffer size for verifying samples/chirp |
| Requirements Tested | 1290125 |

# Test Suites Chapter 3.2 Safety API

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall provide configuration which errors are handled autonomously by the RFE Safety SW, via RFE Safety API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check Safety configuration using RFE API with errors to be handled by RFE SW. |
| rfe\_tc\_xxxx | Check RFE SW behaviour for errors which are not to be handled by RFE SW by injecting faults. |
| Requirements Tested | 1311273 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall provide setting of FTTI time for RFE SW, via RFE Safety API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check setting the FTTI for RFE SW using Safety API with invalid value and verify the response error code. |
| Rfe\_tc\_xxxx | Check setting the FTTI for RFE SW using Safety API with valid value. |
| rfe\_tc\_xxxx | Verify self-test for every FTTI durations. |
| Requirements Tested | 1299512 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall provide configuration of TCM recoverable errors threshold level, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check using Safety API the configuration of TCM recoverable error threshold with an invalid level and verify the response error code. |
| Rfe\_tc\_xxxx | Check setting the configuration of TCM recoverable error for RFE SW using Safety API with valid value. |
| rfe\_tc\_xxxx | Verify by injecting faults and check the behaviour. |
| Requirements Tested | 1305755 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall provide memory recoverable error count, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check setting the configuration of TCM recoverable error for RFE SW using Safety API with valid value. |
| rfe\_tc\_xxxx | Verify by injecting faults and check the behaviour by calling the memory recoverable error count. |
| Requirements Tested | 1299497 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the toggling of the ERROR\_N pin, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Set & test. App integrity test |
| Requirements Tested | 1280570 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall provide toggling of the WDT-INT pin, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Set & test. App integrity test |
| Requirements Tested | 1280394 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE-SW shall provide checking of effectiveness of enabled safety mechanisms, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Verify by injecting faults ( to memories, unmask regs in FCCU, incorrect configurations) and check the RFE SW safety behaviour.  App startup checks. |
| Requirements Tested | 1311219 |

## Test Suite RFE\_TS\_00xx

This test suite is used to test the RFE-SW shall provide checking of effectiveness of disabled (masked) safety mechanisms, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Verify by injecting faults ( to memories, incorrect configurations) and check the RFE SW safety behaviour. |
| Requirements Tested | 1311220 |

## Test Suite RFE\_TS\_00xx

The RFE SW shall provide programming of heart beat (alive) signal interval, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check setting of heart beat signal interval with invalid value and verify the error response code. |
| rfe\_tc\_xxxx | Check setting of heart beat signal interval with valid value. |
| rfe\_tc\_xxxx | Verify the periodicity of heart beat signal interrupt notification on APP-M7 using local timer against the programmed timer value. |
| Requirements Tested | 1311221 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide programming of Rx ADC clipping thresholds, clipping counts via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check setting of Rx ADC clipping thresholds and clipping counts with invalid value and verify the error response code. |
| rfe\_tc\_xxxx | Check setting of Rx ADC clipping thresholds and clipping counts with valid values. |
| Requirements Tested | 1311224 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide error check of RFE registers (for SPI-based RFE IPs, Infra IPs and RFE Digital IPs), via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | TBD (SAF) |
| Requirements Tested | 1311226 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall allow testing of GPIO pins, via RFE Safety API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| Rfe\_tc\_xxxx | Check configuring GPIO pins with invalid value using safety API and verify the error response code. |
| Rfe\_tc\_xxxx | Check configuring GPIO pins with valid value using safety API and verify the error response code. |
| Requirements Tested | 1305771 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide setting of error thresholds, via RFE Safety API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| Rfe\_tc\_xxxx | Check configuring error thresholds with invalid value using safety API and verify the error response code. |
| Rfe\_tc\_xxxx | Check configuring error thresholds with valid value using safety API and verify the error response code. |
| Requirements Tested | 1305772 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide fault injection test (FIT) for the RFE Ips, via RFE Safety API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| Rfe\_tc\_xxxx | Check fault injection of RFE Ips using RFE safety API. |
| Rfe\_tc\_xxxx | Verify the RFE Ips safety behaviour for the injected faults. |
| Requirements Tested | 1305764 |

# Test Suites Chapter 3.3 RFE DFE (Streaming) API

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide programming of number of ADC streams, via the RFE Streaming API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE streaming API with invalid parameters for programming the ADC streams and check the return status. |
| rfe\_tc\_xxxx | Check RFE streaming API with valid programming parameters for programming the ADC streams and verify error returned. |
|  | Check RFE streaming API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280203 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide enabling/disabling of number of ADC streams, via the RFE Streaming API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE streaming API with disabling of number of ADC streams and check the return status. |
| rfe\_tc\_xxxx | Check RFE streaming API with enabling of number of ADC streams and check the return status. |
|  | Check RFE streaming API function with equivalence and boundary input configurations. |
| Requirements Tested | 1290129 |

# Test Suites Chapter 3.4 RFE System API

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide functionality to program calibration data (trimming values) from OTP into the registers of the corresponding IP, via the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check using RFE System API calibrations using OTP and verify the response code. |
| Requirements Tested | 1280693 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide an interface to enable/disable the level shifters of each of the IP, via the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check using RFE System API enable the level shifters of each IP and verify the response code. |
| rfe\_tc\_xxxx | Check using RFE System API disable the level shifters of each IP and verify the response code. |
| Requirements Tested | 1280251 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide an interface to enable/disable the LDOs of each of the Analog IP, via the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check using RFE System API enable LDOs of each IP and verify the response code. |
| rfe\_tc\_xxxx | Check using RFE System API disable LDOs of each IP and verify the response code. |
| Requirements Tested | 1281518 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide an interface to fast switch on/off each of the supporting Analog IP independent from timing engine, via the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check using RFE System API switch ON Analog IP of each IP and verify the response code. |
| rfe\_tc\_xxxx | Check using RFE System API switch OFF Analog IP of each IP and verify the response code. |
| rfe\_tc\_xxxx | Check using RFE System API reset of each Analog IP and verify the response code. |
| Rfe\_tc\_xxxx | Check using RFE System API clock control of RFE IPs |
| Rfe\_tc\_xxx | Check using RFE System API configuration of each temperature sensors of Anlog IP and check the response error code. |
| Requirements Tested | 1281519, 1281520, 1281527, 1296697, 1311325 |

# Test Suites Chapter 3.4.1 Dynamic Chirping

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall provide a (semi-) static and dynamic chirp configuration mode, via the RFE System API

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
|  | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration with static & dynamic chirp valid parameters |
| rfe\_tc\_xxxx | Check RFE IP block Re-calibration app specific |
| rfe\_tc\_xxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check behaviour of RFE BIST |
| rfe\_tc\_xxxx | Raw data is transferred to binary files or streamed to local host on PC and either visualized real-time or analysed offline with default data visualizer. |
| Requirements Tested | 1311315 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in (semi-)static chirp configuration mode, the RFE SW shall provide configuration of the chirp profiles and sequencing parameters supported by RFE, before the start of every system cycle, via the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp configuration mode with invalid parameters and check the error response code. |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp configuration mode with valid parameters. |
| rfe\_tc\_xxxx | Check RFE chirp profile configuration and sequencing parameters with invalid parameters and check the error response code. |
| rfe\_tc\_xxxx | Check RFE chirp profile configuration and sequencing parameters with valid parameters. |
| rfe\_tc\_xxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check behaviour of RFE BIST |
| rfe\_tc\_xxxx | Raw data is transferred to binary files or streamed to local host on PC and either visualized real-time or analysed offline with default data visualizer. |
| Requirements Tested | 1311316 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in dynamic chirp configuration mode, the RFE SW shall support chirp sequence lengths of 1 to 1024.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp sequence length with equivalence and boundary input configurations. |
| Requirements Tested | 1311317 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in dynamic chirp configuration mode, the RFE SW shall support configuration of 1 to 4 sets of static chirp parameters (profiles) for the next system cycle, via the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile with invalid parameters and verify the error response code. |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile with valid parameters. |
| rfe\_tc\_xxxx | Check RFE frame start |
|  | Change the profile parameter for every frame and verify |
| Requirements Tested | 1311318 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in dynamic chirp configuration mode, the RFE SW shall provide configuration of the dynamic chirp parameters for the complete chirp sequence of the next radar system cycle, via the RFE System API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile with valid parameters. |
| rfe\_tc\_xxxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check using RFE SW System API for frame configuration of the dynamic chirp parameters for the complete chirp sequence of the next radar system cycle |
| rfe\_tc\_xxxx | Verify |
|  | Change the profile order for every frame and verify |
| Requirements Tested | 1311319 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW shall support the following dynamic chirp parameters: Phase rotator phase shift for each Tx Fast switch for each Tx Chirp interval time ID of set of static chirp parameters (profile) to be used.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile with valid parameters. |
| rfe\_tc\_xxxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check using RFE SW System API for frame dynamic chirp parameters: Phase rotator phase shift for each Tx Fast switch for each Tx Chirp interval time ID of set of static chirp parameters (profile) to be used. |
| rfe\_tc\_xxxx | Verify |
| Requirements Tested | 1311320 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in dynamic chirp configuration mode, the RFE SW shall program the id of the profile to be used for the next-next chirp in the sequence into the timing engine.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile with valid parameters. |
| rfe\_tc\_xxxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check using RFE SW System API for dynamic chirp configuration mode, program the id of the profile to be used for the next-next chirp in the sequence into the timing engine. |
| rfe\_tc\_xxxx | Verify |
| Requirements Tested | 1311321 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in dynamic chirp configuration mode, the RFE SW shall ensure that consecutive chirps are not using the same timing engine profile registers.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile assigned to each chirp in sequence with valid parameters. |
| rfe\_tc\_xxxx | Check RFE frame start |
| rfe\_tc\_xxxx | Verify using RFE SW System API for dynamic chirp configuration mode, consecutive chirps are not using the same timing engine profile registers. |
| Requirements Tested | 1311322 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in dynamic chirp configuration mode, when the RFE SW is interrupted by the TE for end of chirp acquisition time, it shall overwrite the dynamic parameters of the TE profile registers used for the next-next chirp and finish before that chirp starts.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile assigned to each chirp in sequence with valid parameters. |
| rfe\_tc\_xxxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check using RFE SW System API for dynamic chirp configuration mode, overwrite the dynamic parameters of the TE profile registers used for the next-next chirp. |
| rfe\_tc\_xxxx | Verify |
| Requirements Tested | 1311323 |

## Test Suite RFE\_TS\_00xx

This test suite is used to check the RFE SW while in dynamic chirp configuration mode, the RFE SW shall not write dynamic chirp parameters during the acquisition time of a chirp.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Start up Calibrations ( RFE-M7) app independent |
| rfe\_tc\_xxxx | Check RFE frame configuration static chirp parameter of each set of profile assigned to each chirp in sequence with valid parameters. |
| rfe\_tc\_xxxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check using RFE SW System API for dynamic chirp configuration mode, write dynamic chirp parameters during the acquisition time of a chirp and verify the error response code. |
| rfe\_tc\_xxxx | Verify |
| Requirements Tested | 1311324 |

# Test Suites Chapter 4.2 Infra SW

This test suite is to check the Infra components.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| Rfe\_tc\_xxxx | Check RFE SW CRC computation and verify the result. |
| Rfe\_tc\_xxxx | Check RFE SW GPIO write and read. |
| Rfe\_tc\_xxxx | Check RFE SW clock control and read the clock values and verify. |
| Rfe\_tc\_xxxx | Check RFE SW timer by configuring the timer and read the timer value to verify it is decrementing. |
| Rfe\_tc\_xxxx | Check RFE SW watch dog timer configuration and verify the timeout if it is not reset. |
| Requirements Tested | 1301228, 1280228, 1280128, 1280308, 1280475 |

# Test Suites Chapter 4.4 Main FSM

## Test Suite RFE\_TS\_00xx

This test suite is to check when RFE initialization finishes the RFE SW shall enter an RFE main scheduling loop.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE init function with some invalid input parameters and verify response. |
| rfe\_tc\_xxxx | Check RFE SW initialization with valid parameters and verify error returned. |
| rfe\_tc\_xxxx | Check RFE SW init function with equivalence and boundary input configurations. |
| Requirements Tested | 1280318 |

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW while in main scheduling loop the RFE SW shall handle RFE API calls.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API with valid parameters and check the return status. |
| Rfe\_tc\_xxxx | Check RFE system API with invalid parameters and verify error returned. |
| Rfe\_tc\_xxxx | Check RFE use case API function with equivalence and boundary input configurations. |
| Requirements Tested | 1280360 |

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW while in main scheduling loop the RFE SW shall start handle RFE API calls in less than 0.5 [us].

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE system API timing behaviour . |
| Requirements Tested |  |

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW while in main scheduling loop the RFE SW shall perform periodic RFE monitoring reporting any errors to radar application.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE SW error notification behaviour by introducing errors in SW. |
| Requirements Tested | 1280705 |

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW while in main scheduling loop the RFE SW shall run radar echo FSM one time or periodically as requested

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW while in main scheduling loop the RFE SW shall run radar system cycle FSM on time or periodically as requested

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW while in main scheduling loop the RFE SW shall run radar frame FSM one time upon request

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW while in radar frame execution state the RFE SW will handle Timing Engine end of chirp interrupts for programming the next chirp parameters

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW when in radar frame execution state the RFE SW will handle Timing Engine end of chirp interrupts with the highest priority.

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW when in radar frame execution state the RFE SW will handle Timing Engine end of frame event.

# Test Suites Chapter 4.5 RPC

This test is used to check the RPC. This test runs on APP-M7

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check RFE frame configuration with valid parameters. |
| rfe\_tc\_xxxx | Check RFE IP block Re-calibration app specific |
| rfe\_tc\_xxx | Check RFE frame start |
| rfe\_tc\_xxxx | Check behaviour of RFE BIST |
| Requirements Tested | [1300388](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2FMB_5763a5255c2e4c68a7f642ae0a144c4b&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.), [1300387](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2FMB_1de9ae2c806b4f9ab7a0996698db4a10&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.), [1296742](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_f6f0ab79939649ec984317fbcaeed9dc&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [1300394](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2FMB_d27fd42aa30a4931817d8c2681c69893&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.), [1296738](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_a26d084a8683455aa1434db7229ae04a&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co), [296734](https://doorsng.nxp.com/rm/web#action=com.ibm.rdm.web.pages.showArtifact&artifactURI=https%3A%2F%2Fdoorsng.nxp.com%2Frm%2Fresources%2F_0dfdb450b3e94691a0ab7308002c9d95&oslc_config.context=https%3A%2F%2Fdoorsng.nxp.com%2Fgc%2Fconfiguration%2F425&componentURI=https%3A%2F%2Fdoorsng.nxp.co) |

# Test Suites Chapter 5 Start Up and Initialization

## Test Suite RFE\_TS\_00xx

This test suite is to check when reset the RFE SW shall perform RFE initialization in the following sequence:

RFE-M7 Core Reset  
RFE-M7 Core Start up  
RFE Access IPs Initialization  
RFE Infra IPs Initialization  
RFE Digital IPs Initialization  
RFE Analog IPs Initialization  
RFE SW Initialization

TBD

## Test Suite RFE\_TS\_00xx

This test suite is to check RFE SW shall report initialization results, via RFE API.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | After reset verify using RFE API initialization results. |
| Requirements Tested | 1280163 |

# Test Suites Chapter 6 Functional Safety

## Test Suites Chapter 6.1 General Safety

This test suite is to check the RFE SW shall use timeout to report errors for the functions using while loop with exit condition based on hardware event.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check setting the timeout for RFE SW. |
| rfe\_tc\_xxxx | Check the RFE SW using mocking hardware to make blocking. |
| rfe\_tc\_xxxx | Check for the timeout event. |
| Requirements Tested | 1311229 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall report error if a function using while loop with exit condition based on hardware event, exits executed too early.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check setting the timeout for RFE SW. |
| rfe\_tc\_xxxx | Check the RFE SW using mocking hardware to make blocking. |
| rfe\_tc\_xxxx | Check for the timeout event. |
| Requirements Tested | 1311230 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall send alive signal every programmable interval

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check RFE frame configuration with valid parameters. |
| rfe\_tc\_xxx | Check RFE frame start |
| Rfe\_tc\_xxxx | Verify for the periodic notification requests from RFE |
| Requirements Tested | 1311232 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall set RFE FCCU error flag when error is detected by SW.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check RFE frame configuration with valid parameters. |
| rfe\_tc\_xxx | Check RFE frame start |
| Rfe\_tc\_xxxx | Inject faults into the hardware and verify the FCCU error flags |
| Requirements Tested | 1299507 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall perform recovery action for recoverable errors within a programmable recovery period.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check RFE frame configuration with valid parameters. |
| rfe\_tc\_xxx | Check RFE frame start |
| rfe\_tc\_xxxx | Inject recoverable faults into the hardware and verify the recovery within the recovery period. |
| Requirements Tested | 1311235 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall clear the FCCU fault signals followed successful fault recovery within recovery period.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check RFE initialization with valid value. |
| rfe\_tc\_xxxx | Check RFE frame configuration with valid parameters. |
| rfe\_tc\_xxx | Check RFE frame start |
| rfe\_tc\_xxxx | Inject recoverable faults into the hardware and verify the clearing of the FCCU fault signals within the recovery period. |
| Requirements Tested | 1299508 |

## Test Suite RFE\_TS\_00xx

This test suite is to check the RFE SW shall disable relevant FCCU error monitoring during reset and power down modes in RFE System API calls.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | During reset inject recoverable faults into the hardware and verify the FCCU fault signals. |
| rfe\_tc\_xxxx | During power down inject recoverable faults into the hardware and verify the FCCU fault signals. |
| Requirements Tested | 1280140 |

# Test Suites Chapter 6.1.1 Separation of Concerns

## Test Suites RFE\_TS\_00xx

This test suite is to check the configuration of safety mechanisms shall be done only via a Safety Component.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check the configuration of safety parameters using EB Tresos / S32 CT and verify the generated code. |
| rfe\_tc\_xxxx | Compile the generated code for testing build is successful. |
| Requirements Tested | 1311191 |

# Test Suites Chapter 6.1.2 Memory Initialization

## Test Suites RFE\_TS\_00xx

This test suite is to check the TCMs have to be initialized by entity booting RFE.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Check the content of memory after boot and verify the memory is zero initialised. |
| Requirements Tested | 1311710 |

# Test Suites Chapter 6.1.3 Stack Overfow

This test suite is to check the RFE SW shall detect stack overflow and report error.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Overflow the stack by creating a recursive function and verify the stack overflow error reporting. |
| Requirements Tested | 1366337 |

# Test Suites Chapter 6.1.4 Exception Handlers

This test suite is to check the exception handlers.

TBD

# Test Suites Chapter 6.1.7 IP Register Protection

## Test Suite RFE\_TS\_00xx

This test suite is to check when a bus register is written the RFE SW shall check for correctness of the transaction by reading it back and comparing the values, when an error is concluded the RFE SW shall set the respective error in FCCU and go to error state to start recovery by writing the register, until retry time expires.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Use hardware fault injection for errors in register. Check the FCCU status flags for errors. |
| Requirements Tested | 1280630 |

## Test Suite RFE\_TS\_00xx

This test suite is to check when a bus register is read the RFE SW shall check for correctness of the transaction by reading it for the second time and comparing the values, when an error is concluded RFE SW shall set the respective error in FCCU and shall go to error state to start recovery by reading the register, until retry time expires.

|  |  |
| --- | --- |
| **Test Case** | **Description** |
| rfe\_tc\_xxxx | Use hardware fault injection for errors in register. Check the FCCU status flags for errors. |
| Requirements Tested | 1280693 |

# Test Suites Chapter 6.1.4 Temperature Sensing and Reaction

## Test Suites Chapter 6.1.6 Host Communication

### Test Suites Chapter 6.1.7 Application Context

### Test Suites Chapter 6.2 RFE Autonomous Safety

# Test Suites Chapter 7 Non Functional Requirements

# Test Suites Chapter 10 RFE Driver

## Test Suites Chapter 10.1 Functional Requirements

## Test Suites Chapter 10.2 Functional Safety Requirements

## Test Suites Chapter 10.3 Non Functional Requirements

# Test Cases

## rfe\_tc\_0000

### Detailed Description

Check RFE use case API with valid parameters and check the return status.

|  |  |
| --- | --- |
| Name |  |
| Test Level | Unit |
| Test Type | Negative |
| Test Method: | Interface |
| Test Technique | Blackbox |
| HW Environment | This test executes on Evaluation Board with OneChip silicon |
| Pre-conditions: |  |
| Pass/Fail Criteria | The test is considered PASSED if all the conditions below are true during test session  execution.  - All expected results are correct |
| Requirements Tested | 1280200 |

### Test Procedure

## rfe\_tc\_0001

Check RFE use case API with invalid parameters and verify error returned.

### Detailed Description

|  |  |
| --- | --- |
| Name |  |
| Test Level | Unit |
| Test Type | Interface |
| Test Method: | analysis of requirements |
| Test Technique | BlackBox |
| HW Environment |  |
| Pre-conditions: |  |
| Pass/Fail Criteria |  |
| Requirements Tested | 1280200 |

### Test Procedure

Test procedure explained stepwise.

# Acceptance Reviews and Approvals

# Annexes

# Document Information

## References

| ***Item*** | ***Description*** |
| --- | --- |
|  |  |

## Terms/Acronyms and Definitions

| ***Acronym / Terms*** | ***Definition*** |
| --- | --- |
|  |  |
|  |  |

## Revision History

| ***Document Author*** | ***Version*** | ***Status*** | ***Date*** | ***Description of Change*** |
| --- | --- | --- | --- | --- |
| Biju Ravindran | 0.1 | <Add status  e.g: Approved/In-Review> | <insert date> | <add a short description of the change> |
|  |  |  |  |  |
|  |  |  |  |  |