Software Requirements Specification (SRS)
Module: ChipControl

1 Introduction

The ChipControl module provides control and monitoring functionalities for the LTC2943 chip. It offers a set of APIs to interact with the chip and retrieve information related to the ADC mode, temperature alerts, charge thresholds, and charge status.

2 Functional Requirements

2.1 Initialize the ChipControl Module

- The module shall provide a function to initialize the ChipControl module and configure it for communication with the LTC2943 chip.
- Preconditions:
  - The RTOS is initialized and running.
- Postconditions:
  - The ChipControl module is initialized successfully.

2.2 Get ADC Mode

- The module shall provide a function to retrieve the current ADC mode from the LTC2943 chip.
- The function shall return the ADC mode as an output parameter.
- Preconditions:
  - The ChipControl module is initialized and configured.
- Postconditions:
  - The ADC mode is obtained from the LTC2943 chip.

2.3 Set ADC Mode

- The module shall provide a function to set the ADC mode on the LTC2943 chip.
- The function shall take the desired ADC mode as an input parameter.
- Preconditions:
  - The ChipControl module is initialized and configured.
- Postconditions:
  - The ADC mode is set on the LTC2943 chip.

2.4 Check Temperature Alert

- The module shall provide a function to check if there is a temperature alert on the LTC2943 chip.
- The function shall return a Boolean value indicating the presence of a temperature alert.
- Preconditions:
  - The ChipControl module is initialized and configured.
- Postconditions:
  - The temperature alert status is determined.

2.5 Set Charge Thresholds

- The module shall provide a function to set the charge thresholds on the LTC2943 chip.
- The function shall take the minimum and maximum charge thresholds as input parameters.
- Preconditions:
    - The ChipControl module is initialized and configured.
- Postconditions:
    - The charge thresholds are set on the LTC2943 chip.

2.6 Get Charge Status

- The module shall provide a function to retrieve the current charge status from the LTC2943 chip.
- The function shall return a Boolean value indicating the charge status.
- Preconditions:
    - The ChipControl module is initialized and configured.
- Postconditions:
    - The charge status is obtained from the LTC2943 chip.

3 Non-Functional Requirements

3.1 Performance

- The ChipControl module shall provide efficient and timely communication with the LTC2943 chip to meet the system's performance requirements.
- The module should minimize delays and provide fast response times for accessing chip registers and retrieving information.

3.2 Reliability and Error Handling

- The module shall handle communication errors and chip-related faults gracefully.
- Error codes, status flags, or exception handling mechanisms shall be implemented to report and handle errors effectively.

3.3 Resource Efficiency

- The ChipControl module shall utilize system resources efficiently, including memory, CPU cycles, and power consumption.
- Memory usage should be optimized, and CPU utilization should be minimized without compromising functionality or performance.

4 Constraints

- The ChipControl module is designed specifically for the LTC2943 chip and should adhere to the chip's specifications and guidelines.
- The module does not rely on an RTOS and should be implemented using a suitable programming paradigm or framework.