Self-test configuration for SPC584Bx devices

Introduction

This document provides the guidelines on how to configure the self-test control unit (STCU2) and start the self-test execution in SPC584Bx devices in both offline and online mode.

The STCU2 on SPC584Bx devices manages the memory built-in self-test (MBIST) blocks of the device. The MBISTs can detect latent failures which affect the volatile memories.

The reader of the present document should have a clear understanding of the self-test usage. See Appendix A.1: Reference documents for additional details.

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1 Overview

The SPC584Bx supports the MBIST and not the logic built-in self-test (LBIST). SPC584Bx includes 35 memory cuts. The reader can find the complete list in chapter "Device configuration" of the SPC584Bx reference manual RM0449. Refer to Appendix A.1: Reference documents for additional details.

2 Self-test configuration

Self-test can run either in online or in offline mode. To reach the best trade-off in terms of consumption and execution time, we recommend dividing the MBISTs into 8 splits. The MBISTs inside the same split run in parallel mode. These 8 splits run in sequential mode.

The complete list of the MBISTs and their split is contained in the Microsoft Excel workbook file attached to this document, see "SPC584Bx_split_Rev2.xlsx". Locate the paperclip symbol on the left side of the PDF window, and click it. Double-click on the Excel file to open it.

2.1 DFC list for offline configuration

MBISTs can run in offline mode up to 120 MHz as the maximum frequency. The list of the device configuration format (DCF) to be configured to start up the MBIST during the boot phase (offline mode) is provided in the Microsoft Excel workbook file attached to this document, see "SPC584Bx_DCF_Rev2.xlsx". Locate the paperclip symbol on the left side of the PDF window, and click it. Double-click on the Excel file to open it.

MBISTs run in full run mode to reach the maximum diagnostic coverage, and they take around 72 ms.

2.2 Online mode configuration

In online mode the split list remains the same with some limitations due to life cycle (LC). All MBISTs can run in online mode only in ST production and failure analysis (FA).

In the other LCs, it is not allowed to run the MBISTs of the hardware system module (HSM) and flash volatile memory resources.

The maximum frequency is 120 MHz, provided by the sys_clock. In this case STCU registers can be configured with the "register value" column of the DCF list file.

3 Summary

The SPC584Bx supports the MBIST only and not the LBIST. The user can run the MBIST either in offline or in online mode with the same configuration in terms of:

- Frequency setting
- MBIST algorithm
- MBIST sequence (split list)

Appendix A Other information

A.1   Reference documents

Table 1. Reference documents

Doc name	Document title
RM0449	SPC58 4B Line - 32 bit Power Architecture automotive MCU z4 core 120 MHz, 2 MBytes Flash, HSM, ASIL-B
AN4551	SPC574K72xx self-test procedures

A.2   Acronyms

Table 2. Acronyms

Acronym	Name
MBIST	Memory built-in self-test
LBIST	Logic built-in self-test
STCU2	Self-test control unit
HSM	Hardware system module
LC	Life cycle
DCF	Device configuration format (DCF) records
UTest	User test Flash block
FA	Failure analysis

Revision history

Table 3. Document revision history

Date	Revision	Changes
07-Jan-2020	1	Initial release.
13-Nov-2024	2	Updated attached files. Minor text changes.

Contents

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