SMU_Reset_Alarm_1 for KIT_AURIX_TC297_TFT

Reset triggered by an SMU alarm

AURIX™ TC2xx Microcontroller Training
V1.0.0

Scope of work

The SMU triggers an alarm, which resets the device as preconfigured reaction.

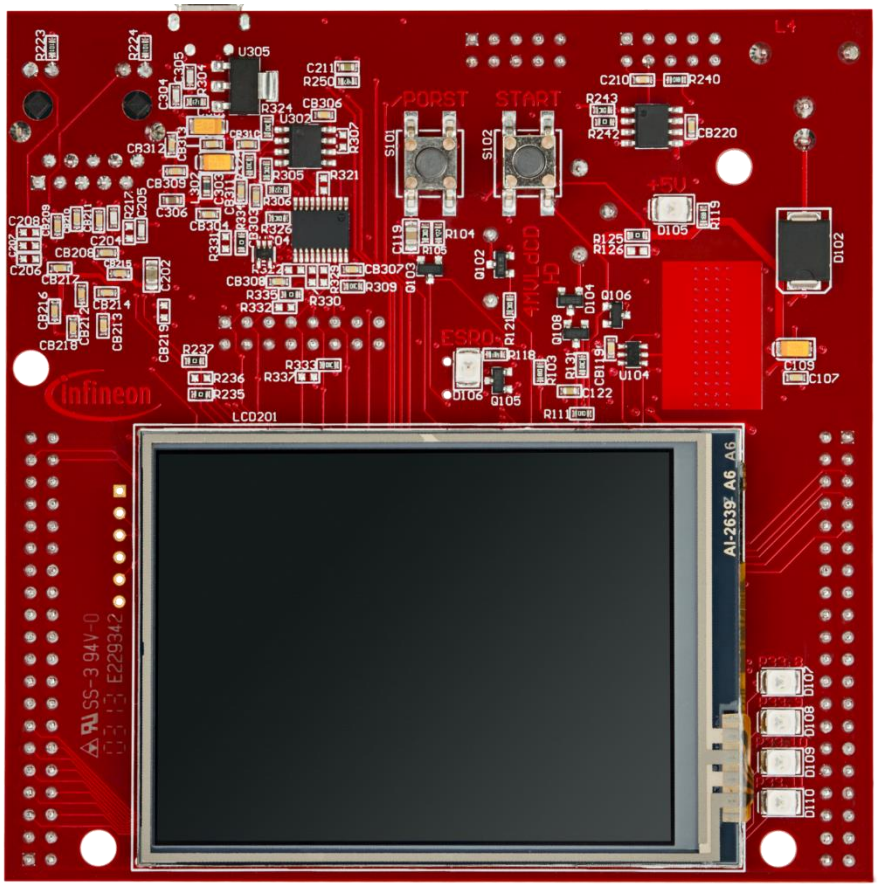
The Safety Management Unit (SMU) is configured to trigger a reset if an internal software alarm occurs.

Introduction

- The Safety Memory Unit (SMU) is a central and modular component of the safety architecture providing a generic interface to manage the behavior of the microcontroller under the presence of faults.
- The SMU centralizes all the alarm signals related to the different hardware- and software-based safety mechanisms.
- Each alarm can be individually configured to trigger internal or external actions.
- The SMU in combination with the embedded safety mechanisms, is able to detect and report more than 99% of the critical failure modes.
- In this example, Software Alarm 0 is used to trigger a reset.

Hardware setup

This code example has been developed for the board KIT_AURIX_TC297_TFT_BC-Step.



Implementation

Configure the SMU module

- To trigger a reset with an SMU alarm, a few steps are required:
  - To modify the SMU registers, the SMU module has to be unlocked with the function ***IfxSmu_unlock()***. After modification, the SMU registers have to be locked again using the function ***IfxSmu_lock()***.
  - To modify SMU configuration registers, it is required to clear and set the Safety ENDINIT protection. This is done with the functions ***IfxScuWdt_clearSafetyEndinit()*** and ***IfxScuWdt_setSafetyEndinit()***.
  - To enable the SMU reset, the SMU field of the Reset Configuration Register (**RSTCON**) has to be set to 0x1 for a system reset or 0x2 for an application reset (***SCU_RSTCON.B.SMU = 0x1***).

Implementation

Configure the SMU module (cont.)

- The function ***IfxSmu_setAlarmConfig()*** configures the alarm's behavior by writing a 3-bit code to the three Alarm Configuration Registers associated to the specific alarm and its group. In this example, the software alarm 0 (***IfxSmu_Alarm_SoftwareAlarm0***) and the SCU reset (***IfxSmu_AlarmConfig_scuReset***) are selected. The iLLD function itself selects the group based on the above mentioned parameters.
- Start the SMU state machine (SSM) with the function ***IfxSmu_cmd()*** and the parameter ***IfxSmu_Cmd_start***.

The functions above are provided by the iLLD headers ***IfxSmu.h*** and ***IfxSrc.h***.

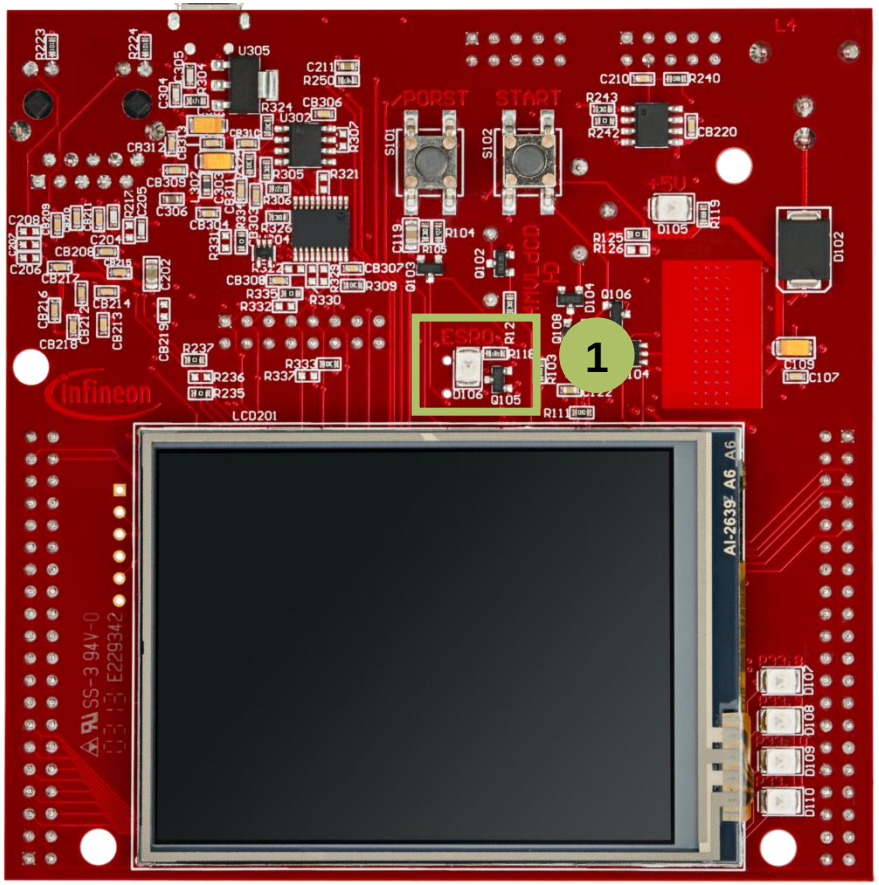
Implementation

Triggering of the alarm

- The Software Alarm 0 can be triggered with the function ***IfxSmu_triggerAlarm()*** provided by the iLLD header ***IfxSmu.h***.

Run and Test

After code compilation and flashing the device, check if LED D106 (1) is turned on.



References

- AURIX™ Development Studio is available online:
- https://www.infineon.com/aurixdevelopmentstudio
- Use the *„Import...“* function to get access to more code examples.

- More code examples can be found on the GIT repository:
- https://github.com/Infineon/AURIX_code_examples

- For additional trainings, visit our webpage:
- https://www.infineon.com/aurix-expert-training

- For questions and support, use the AURIX™ Forum:
- https://www.infineonforums.com/forums/13-Aurix-Forum

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