SCU_Reset_Detection_1

Detection of reset type

AURIX™ TC2xx Microcontroller Training
V1.0.0

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Scope of work

This example shows how to detect the source of the last reset (power-on reset, watchdog reset, etc.)

The AURIX™ TC2xx devices can be reset by various reset sources. The application software is able to determine the source of the last reset based on a routine that evaluates the related reset special function register.

Introduction

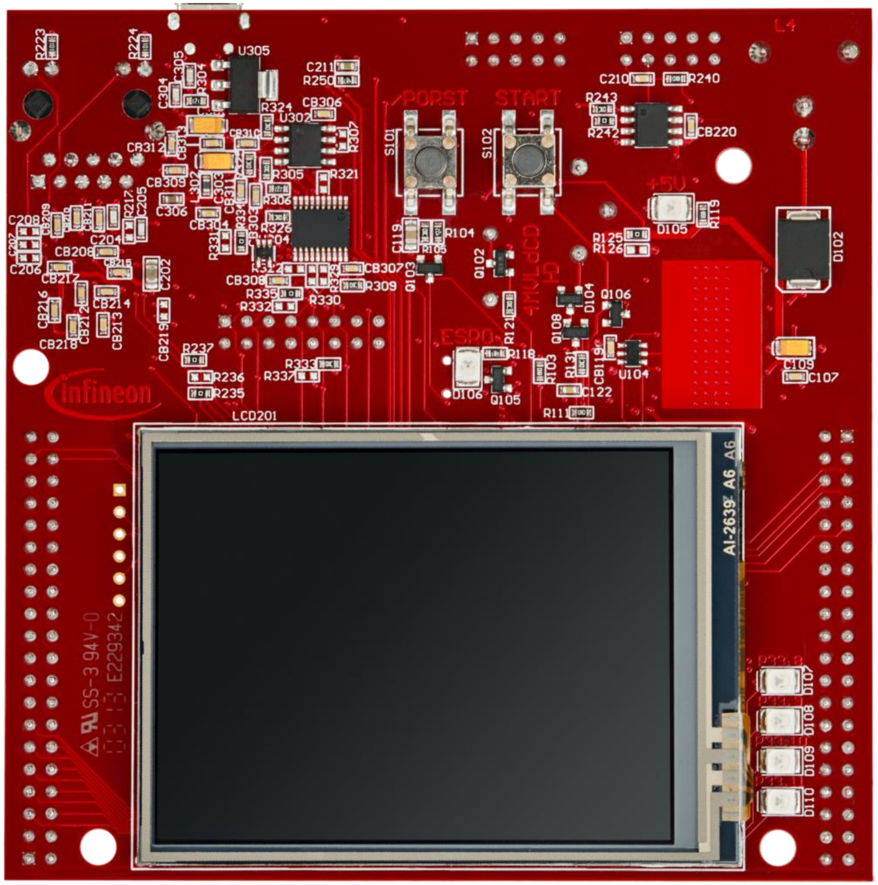
- Resets can be configured and determined in the Reset Control Unit (RCU), belonging to the System Control Unit (SCU).

- There are various reset triggers such as SupplyMonitor, EVRs, PORST, ESRx, JTAG.

- Consequently, different reset types can be derived, such as Cold-/Warm-Power-On Reset, System Reset, Application Reset, Debug Reset, Module Reset.

Hardware setup

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



Implementation

startScuResetDetection()

- This function executes the ***evaluateReset()*** function, which provides information about the last occurred reset. The returned value is a data structure comprising elements such as ***resetType*** and ***resetTrigger***.

- The ***resetType*** specifies the type of the last reset (e.g. a Cold Power-On Reset, System Reset, Application Reset or Warm Power-On Reset).

- The ***resetTrigger*** specifies the source of the last reset. For instance, the source can be a Power-On Reset (pressing PORST-Button), a SW triggered reset or a reset triggered by debugger or any voltage supervision monitor.

- Furthermore, the function ***evaluateReset()*** clears the Cold Power-On sticky bits using the function ***clearColdPowerOnResetBits()****.* Those bits are not cleared automatically and must be explicitly cleared by the application.

- The local variable ***swReset*** can be used to specify the type of SW-Reset initiated by the function ***triggerSWReset()***.

Implementation

evaluateReset()

- The function ***evaluateReset()*** evaluates both the ***SCU.RCU.RSTSTAT*** and ***SCU.RCU.RSTCON*** registers.

- The ***SCU.RCU.RSTSTAT*** register is evaluated with regard to which reset bits are set, respectively, cleared. Firstly, the warm reset status bits comprising ***ESRx***, ***SMU***, ***SW***, ***STMx*** and ***CBx*** are evaluated. Secondly, the cold reset status bits comprising ***EVR13***, ***EVR33***, ***SWD*** and ***STBYR*** are evaluated if none of the warm reset status bits are set. Finally, the ***PORST*** bit is evaluated.

- The ***SCU.RCU.RSTCON*** is evaluated to determine the type of reset, specified for the warm reset status bits, except debugger related reset sources.

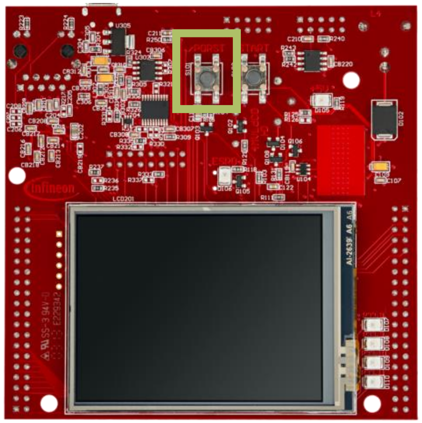
triggerSWReset()

- This function was developed only for testing purposes. Based on the local variable ***swReset***, it triggers either a SW Application Reset or a SW System Reset.

Run and Test

After code compilation and flashing the device, perform the following steps:

1. Run the code
2. Suspend the code execution
3. Watch the local structure variable ***lastReset*** (the elements ***lastReset.resetType*** and ***lastReset.resetTrigger***)
4. Check whether the ***lastReset.resetType*** is set to 'application' reset and whether the ***lastReset.resetTrigger*** is set to 'cb3'.
5. Press button 'PORST'



6. Perform steps 1. through 3.
7. Check whether the ***lastReset.resetType*** is set to 'warmpoweron' reset and whether the ***lastReset.resetTrigger*** is set to 'porst'.

Run and Test

8. Set the local variable ***swReset*** to '1'
9. Perform steps 1. through 3.
10. Check whether the ***lastReset.resetType*** is set to 'application' reset and whether the ***lastReset.resetTrigger*** is set to 'sw'.
11. Set the local variable ***swReset*** to '2'
12. Perform steps 1. through 3.
13. Check whether the ***lastReset.resetType*** is set to 'system' reset and whether the ***lastReset.resetTrigger*** is set to 'sw'.

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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