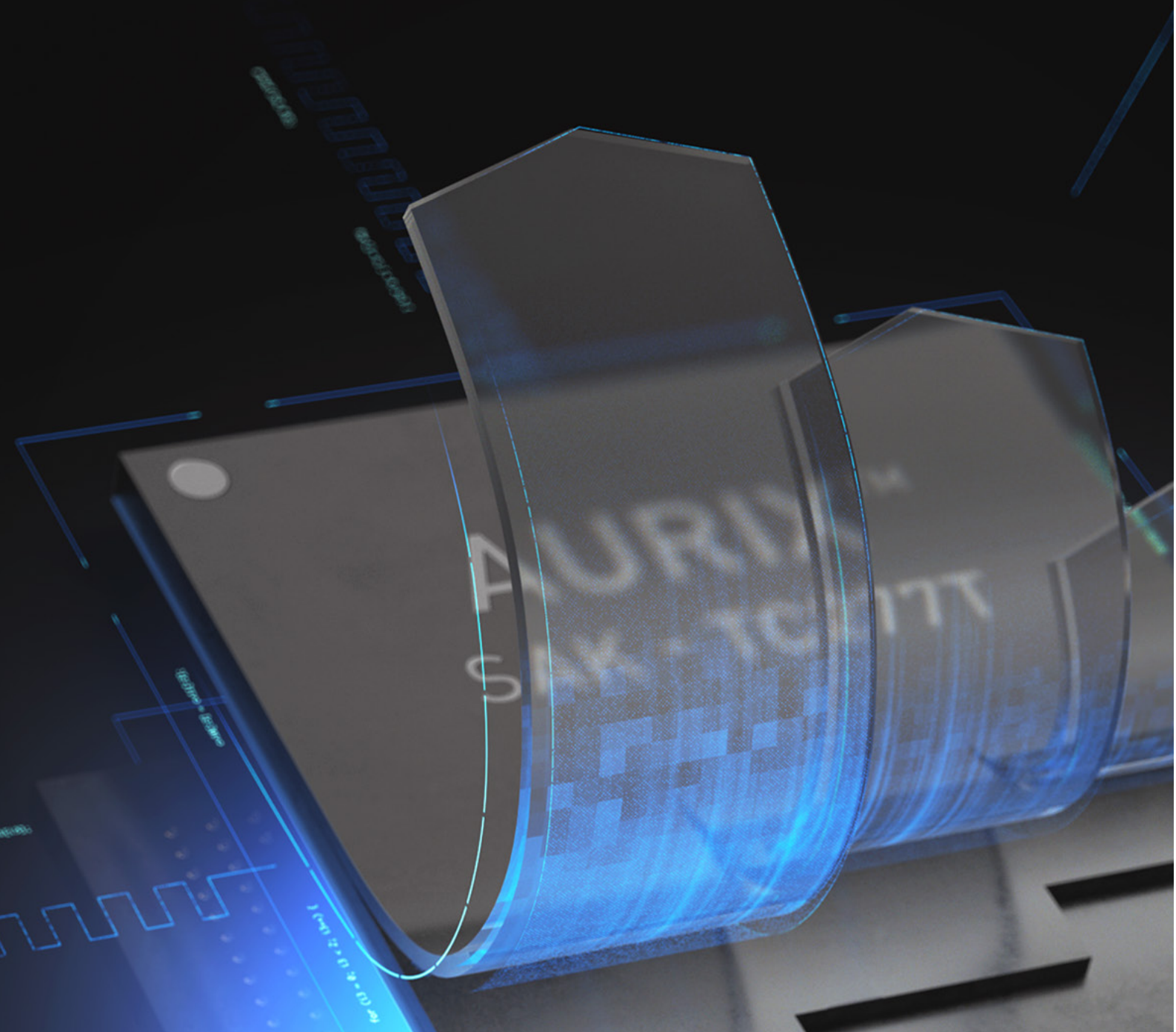


TASKING

Multi Core Performance Tool

For Infineon AURIX Devices



Multi Core Performance Tool

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PERFORMANCE OPTIMIZATION FOR EVERY DESKTOP

The TASKING® Multi Core Performance Tool enables software architects, function architects and system testers to fully utilize the multi-core technology of Infineon AURIX™ devices and as a result, to make improvements in the software to either increase bandwidth, make it more efficient, or select a device to fit the needs. TASKING® Multi Core Performance Tool is a 64-bit application to ensure fast real-time operation and the handling of large trace files.

The tool features an intuitive graphical interface generating a report of the load of each core by extracting the information from the ELF file and data traced during run-time. In the GUI you can dig deeper by selecting a core and get the load view for each process running on the selected target. Expert-level knowledge about the TriCore/AURIX inner-workings and RTOS/AUTOSAR knowledge has been built into the tool, which enables the TASKING® Multi Core Performance Tool to point exactly to the root cause of a performance bottleneck in regards to core load and parallelization of software components. The data is presented in graphics and tables and allows you to take advantage of raw trace data to generate custom reports.

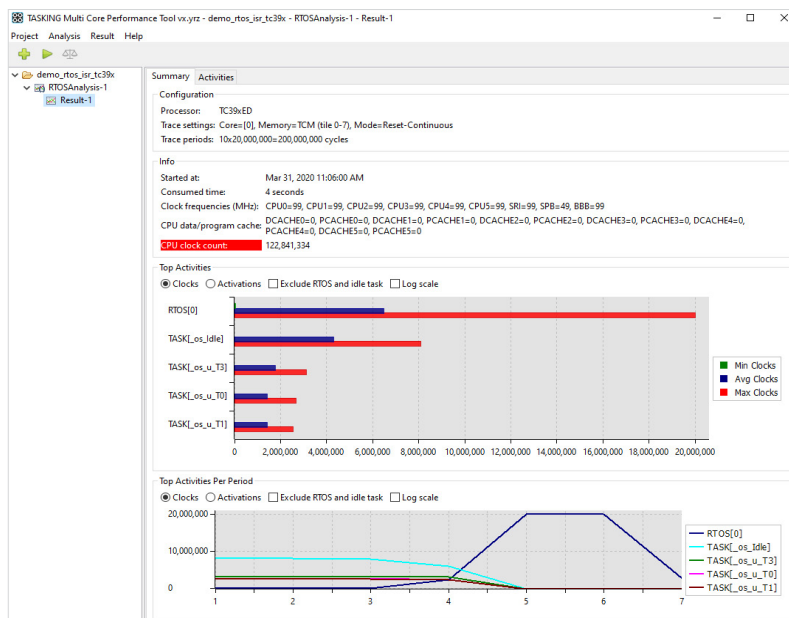


Figure 1 : RTOS analysis summary

Product Features and Benefits

- The tool accurately measures the behavior and interaction of all software components running on an AURIX multi-core device during run-time (core load analysis)
- Points to the tasks and functions which overloads the cores
- Detects and highlights the time slot when a core overload happens
- Provides clear guidance to reach a safe and equally distributed system load
- Real-Time Operating System (RTOS) analysis
- Compare analysis runs of the same kind
- Organize analyses and results in projects
- Load/store analysis results
- Graphical user interface (GUI) and command line interface (CLI) support
- Export analysis results to comma separated values (CSV) files
- ISO26262 compliance achieved via ASPICE level 2 tool development process

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Deployment of the TASKING® Multi Core Performance Tool in a software test environment is also supported via a command-line batch mode.

Typical use cases for the tool where performance tuning of your application makes sense are:

- You are using self-made libraries that are called a lot and thus have a big impact on overall application performance.
- You develop/adapt low level drivers and basic software (BSW) components.
- You are close to or above your core load budget limit.
- You have a timing problem in your schedule that could be fixed by speeding up specific tasks but want to avoid changing the schedule.
- You want to try and target a smaller electronic control unit (ECU) in order to save costs.
- You care about easily and cost effectively tracking and improving the performance of your code on target devices.

You can use the TASKING® Multi Core Performance Tool to compare analysis runs of the same kind. Using such a performance tuning tool, non-expert users can often highly speed up untuned applications.

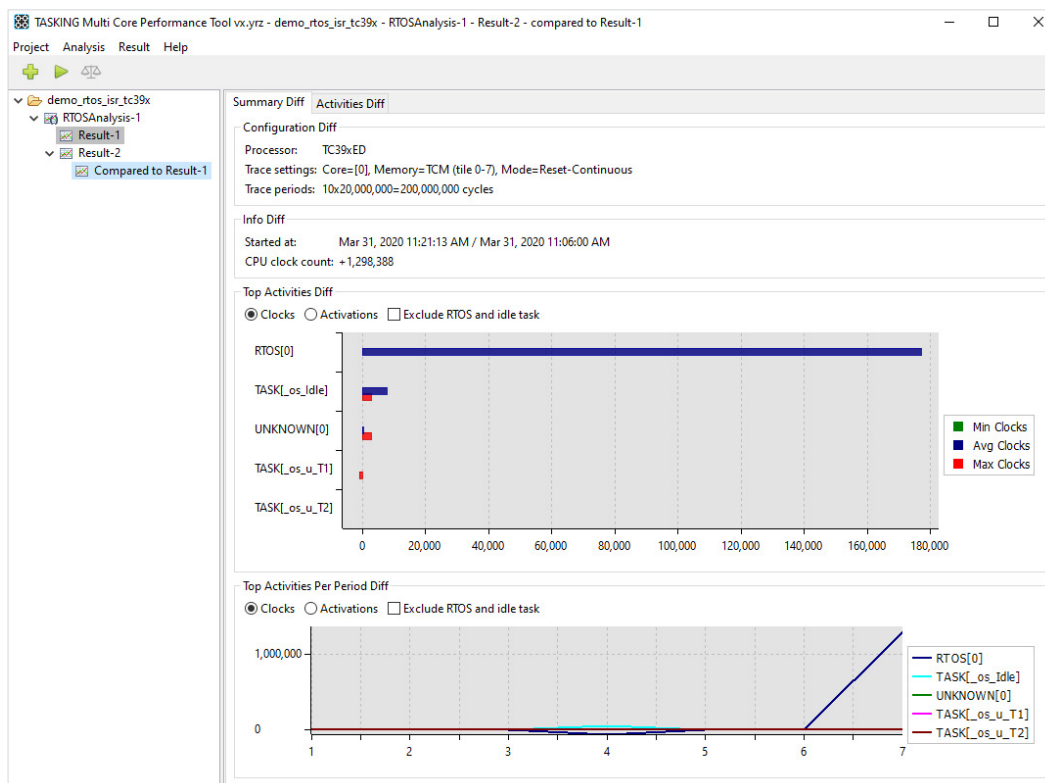


Figure 2 : Compare results

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COLLECTING AND ANALYZING PERFORMANCE DATA

The TASKING® Multi Core Performance Tool can be configured to collect performance data from two types of analyses :

- Core Load Analysis
- Real-Time Operating System (RTOS) Analysis

The core load analysis collects data to visualize the minimum, average and maximum load on each core of the selected processor. It measures the time in the given idle function(s) and/or ranges(s) for the given time period(s). As you can see in the following example, core 0 and core 5 do not spend time in the idle function.

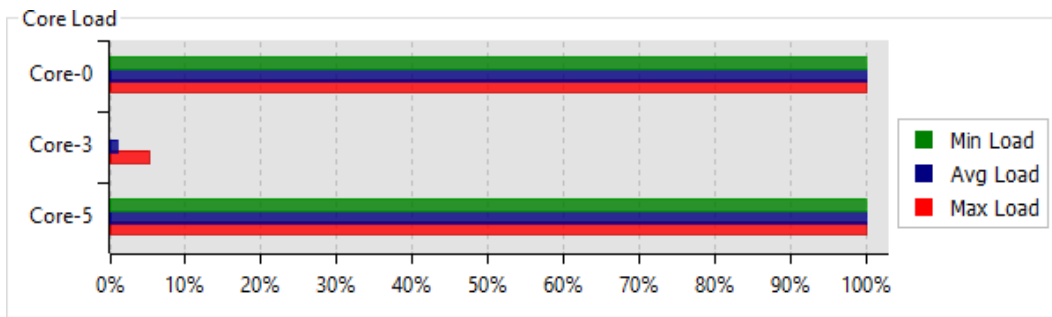


Figure 3: Core Load Analysis showing Min/Max/Avg load for each core

The Core Load Per Period is a part of the Core Load analysis displayed on the Summary tab and is only visible when there are multiple periods. This graph shows the load of each core per period.

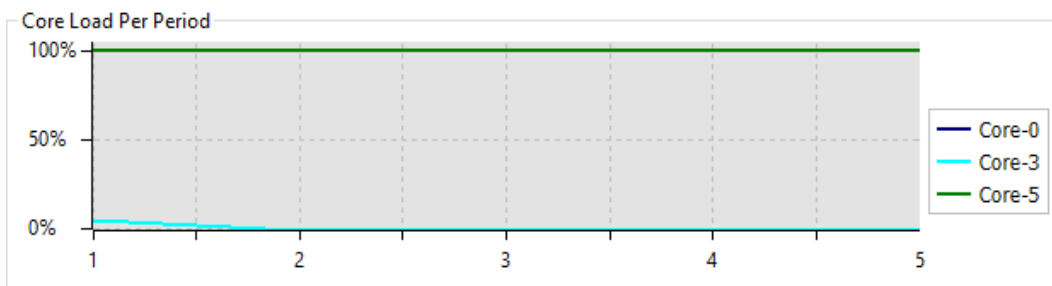


Figure 4: Core Load Per Period

Multi Core Performance Tool

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The Top Activities is a part of the RTOS analysis displayed on the Summary tab. This graph shows the top activities sorted on either the Clocks or the Activations. The Exclude RTOS and idle task check box removes the RTOS activity and the given idle task, when this check box is enabled. When the check box Log scale is enabled the graph is displayed in logarithmic scale.

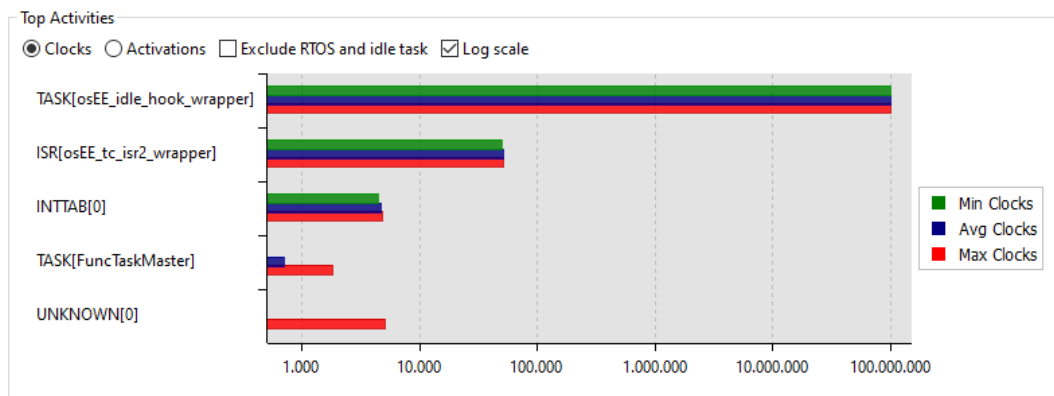


Figure 5: Top Activities of RTOS analysis

The Top Activities Per Period is a part of the RTOS analysis displayed on the Summary tab and is only visible when there are multiple periods. This graph shows the top activities per period sorted on either the Clocks or the Activations. The Exclude RTOS and idle task check box removes the RTOS activity and the given idle task, when this check box is enabled. When the check box Log scale is enabled the graph is displayed in logarithmic scale.

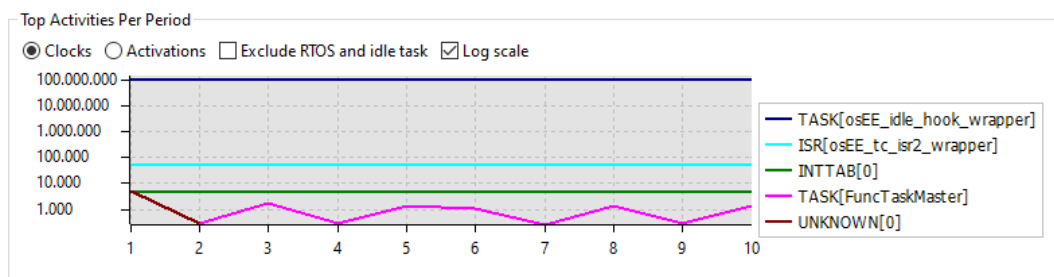


Figure 6: Top Activities Per Period

TARGET DEVICE RESOURCE USAGE

The TASKING® Multi Core Performance Tool uses the Multi-Core Debug Solution (MCDS) for on-chip trace support. The following on-chip trace memory types are supported:

- Trace Calibration Memory (TCM)
- Extended Trace Memory (XTM)
- miniMCDS Trace Memory (TRAM)

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DEVICE SUPPORT

The TASKING® Multi Core Performance Tool can perform core load analysis on Infineon AURIX™ microcontroller.

Currently the following devices are supported:

Device	Device MCDS type
TC23xED	MCDS
TC26xED	MCDS
TC27xED	MCDS
TC29x	miniMCDS
TC29xED	MCDS
TC35x	MCDSLigh
TC37xEXT	MCDS
TC38x	miniMCDS
TC39xAED	MCDS
TC39xED	MCDS

The TASKING® Multi Core Performance Tool connects to the target via the latest Device Access Server driver (DAS) or via any of the Device Access Port (DAP) miniWigglers that are supported by the DAS drivers. All debug interfaces supported by the Infineon miniWiggler can also be used to connect to the target hardware.

HOST PLATFORMS

Microsoft Windows 64-bit

SUMMARY

The TASKING® Multi Core Performance Tool is a cost-efficient tool that enables expert and non-expert users to optimize the available bandwidth of each core and to improve system performance for embedded software running on a given platform with Infineon AURIX devices. Integrating the TASKING® Multi Core Performance Tool into your software development process and test flow offers a means to identify and address performance issues immediately and to reach a safe and equally distributed system load. As a result, either the cost of the hardware used can be reduced, or additional features can be implemented without increasing the hardware cost.