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**RELEASE NOTES**
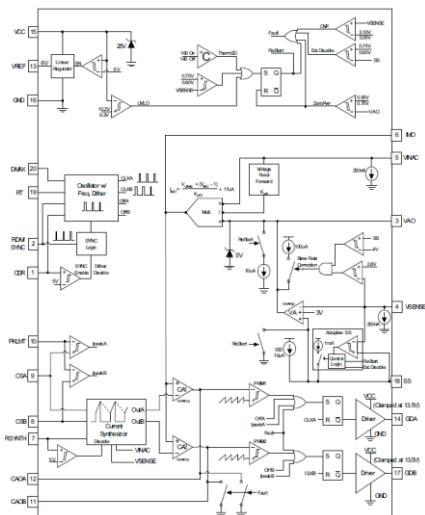
# Altair® PSIM™ 2023.1

# New Features and Enhancements 2023.1
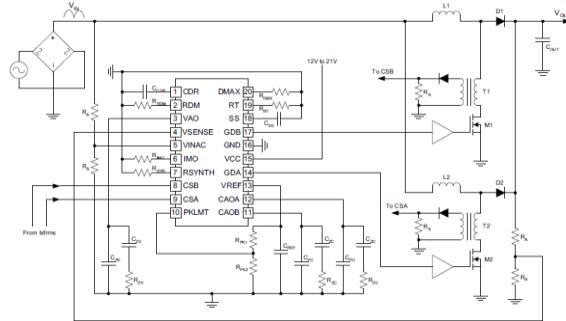
## Release Highlights

### Power Factor Correction (PFC) IC detailed modeling and its applications

Interleaving Power Factor Corrected (PFC) power converters are widely used for various applications, such as Battery On-board-Charger, motor drives, etc. The TI UCC28070 Interleaving Continuous Conduction Mode PFC Controller is developed to be used to control PFC power converters. UCC28070 chipset model is developed in PSIM and the simulation of PFC power converter using UCC28070 is provided.
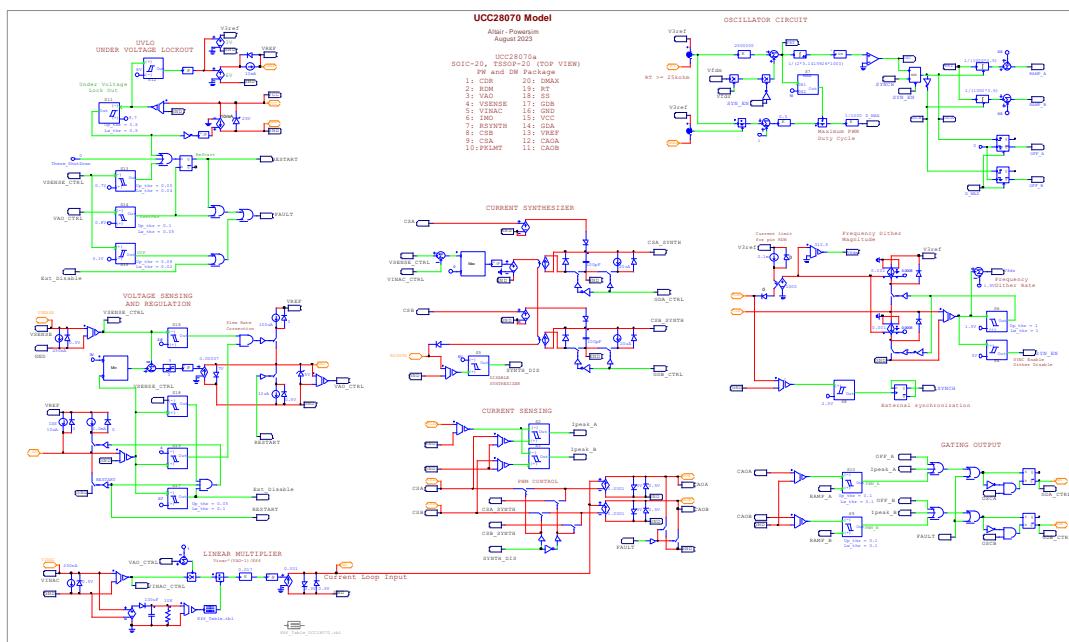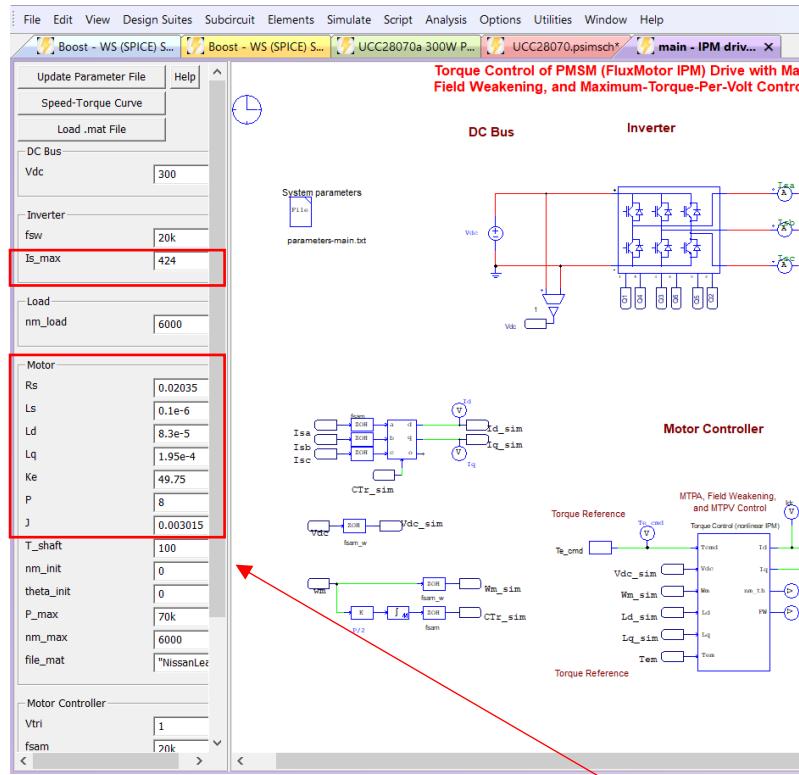
**TI UCC28070 Functional Diagram**

**PFC power converter using UCC28070 chip set**



**PSIM model of UCC28077**

# Automatic motor data extraction from Flux/FluxMotor Lookup Tables for Motor Control Design Suite (MCDS)



## Faster and more accurate ac sweep of passive circuits

- Leverage Altair SPICE solver – HyperSpice to perform ac sweep for passive circuits
- Use PSIM solver to perform ac sweep for switching and control circuit

## Enhanced thermal database

- Xml format of thermal data is added to the thermal device database so that the power devices with xml format found in many semiconductor manufacturer websites can be imported to PSIM for the thermal and power loss simulations.

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## New PSIM functions in Python environment

- Python_PsimSimulate
- Python_PsimSimulate_LTSpice
- Python_PsimSimulate_HyperSpice
- Python_PsimASimulate
- Python_PsimIsSubcircuit
- Python_PsimReadGraphFile
- Python_PsimWriteGraphFile
- Python_PsimSimview
- Python_PsimOpenFile
- Python_PsimSaveFile
- Python_PsimCloseFile
- Python_PsimCreateNewElement
- Python_PsimSetElmValue
- Python_PsimGetElementList

## New PSIM-Compose OML functions

- PsimSimulate_LTSpice
- PsimSimulate_HyperSpice
- PsimOpenFile
- PsimSaveFile
- PsimCloseFile
- PsimCreateNewElement
- PsimSetElmValue
- PsimGetElementList

## PSIM-Embed Wrapper PIL Examples

- The PSIM-Embed wrapper PIL examples are added from the PSIM v2023.1 release. The goal of Embed PIL is to leverage Embed code generation capabilities for the target DSPs that are not supported by PSIM.

- The PIL examples are provided with the PSIM installer. One TI (PIL-F28069- 20K) and one ST example (PIL-F303RE-20K) are provided for a Buck Converter schematic having fixed-point calculation at a 20kHz sampling rate.

## New Elements Support:

- Fuse Model
- MOV Model
- DPWM2 and DPWM3 Blocks
- UCC28070/ UCC28070A IC

# New Examples:

- Examples: PSIM-Compose Demos
- Examples: Python Library Demos
- Examples: Code Generation – Embed Wrapper (PIL Wrapper)
- Examples: Fuse Model
- Examples: MOV Model
- Examples: DPWM2 and DPWM3 Blocks
- Examples: UCC28070/ UCC28070A PFC

# New and Updated Tutorials and Manuals:

- "How to Use PSIM-Embed Wrapper"
- "PSIM User Manual"
- "Simcoder User Manual"

# Resolved Issues:

- Error message when HASP not detected
- monte carlo distributions allow impossible component values (negative R, C, etc.)
- [Activate-PSIM] Crash on Re-Run from Activate with Thermal Module
- Menu items are duplicated under Design Suites and Help
- user cannot use PWM 8 - aparrent hardware config conflict
- CLONE Ticket for Chinese Language - display error of the characteristic graph of PcdEditor
- Parameter file dialog - Internal check box
- In element parameter dialog: Set as default value is not functioning
- Issue with too many license checks
- PSIM Crash while Simultaneous Running of Two HyperSpice Simulations
- display error of the characteristic graph of PcdEditor
- FFT Angle(D) wavewform appears in Rad when added as new curve at a screen that previously contained Angle(R) waveforms
- Test condition Rg can't be zero
- Invalid psim.lic file in PSIM folder causes PSIM to exit with no error message.
- PWM outputs are different between hardware and simulation when phaseshift changes from near a PWM period to a small shift
- Help Index file encoding for Chinese language
- Different ac sweep results in HyperSpice and LTspice
- All the token license checkout use the same Netlib object
- PSIM2023 library browser problem with legacy license
- Remove the word "Module" from the PSIM library
- F2803x 2-phase PWM added mode 7 and mode 8 but no description in the document
- Very different simulation times between 2022.3 and 2023
- Error message "The name is too long! Reduce the number of characters."
- PWM9 can't be assigned to GPIO161,
- Error pops up when simulating elements with newly acquired license
- Update the IPRN
- EULA Text Display issue
- CLONE - PSIM cosimulation error Unable to load the PSIM DLL (pcdbasic.dll and Psim2.dll
- PSIM CoSimulation Link with Activate and Embed
- Example correction: test - cSi_Solar_Module
- Help Content Only in English for PMSM_Flux and PMSM_FluxMotor: From PSIM-474 Epic
- "Separate Rth_diode" checkbox in PcdEditor for MOSFET_EON device doesnt get saved
- Thermal module MOSFET(Eon) help images modification request - From PSIM-474 Epic
- Thermal model extrapolations when low and negative case and junction temperatures occur