RAA214023 Simetrix Model

This document discusses the Simetrix model for the RAA214023 LDO including the features supported and not supported by the model. To download the model, see the RAA214023 product page.

Contents

1. Model Features

This Simetrix Macromodel is intended to give typical DC and AC performance characteristics under a wide range of external circuit configurations using compatible simulation platforms such as iSim PE.

1.1 Device Performance Features Supported

The following are the device performance features that are supported by this model.

- Device parameters are set to typical room temperature values
- Output voltage programmed using internal and external resistors
- Gain and phase
- Input noise terms including 1/f effects
- PSRR
- Transient V_{IN}, V_{OUT}, and Load. Reference the Excel spreadsheet that is included with the SPICE software (Figure 1), for test results (RAA214023 Simetrix Model Validations.xlsx).
- Output current limit
- Enable and Disable function using the Enable pin.
- Power-Good through the PG pin.
- UVLO <1V and 300Ω output impedance.
- 300Ω output pull-down when part is disabled and V_{IN} > 1V
- 300Ω output pull-down when part is enabled and 1V < V_{IN} > 2.5V

1.2 Device Performance Features NOT Supported

The following are the device performance features that are NOT supported by this model.

- Harmonic distortion effects
- Thermal effects and/or over-temperature
- Parameter variation
- Part-to-part performance variation because of normal process parameter spread
- Any performance difference arising from different packaging

2. Downloading and Running the Software

The RAA214023 Simetrix model software can be down loaded from the RAA214023 product page.

Save the file to a common directory for your Simetrix simulations. This application note assumes you have a basic knowledge of running Simetrix simulations. There are seven different files to run simulations (Figure 1). Each file is setup to evaluate a specific test (GainPhase, LoadSweep, Noise, NoiseExternalR, PSRR, VoutInternalR, and VsweepExternalR). An Excel spread sheet is also provided documenting the validation of the model. Figure 2 shows the Gain Phase simulation schematic. To run the test, click **Simulator** then **Run Schematic** in the tool bar. From here, you can copy and paste the sub-circuit into your design.

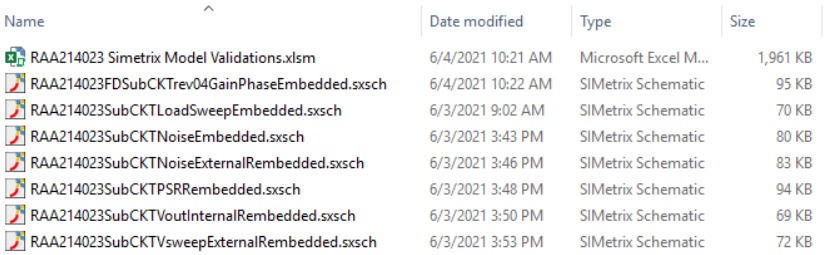

Figure 1. RAA214020 Simetrix Model Software

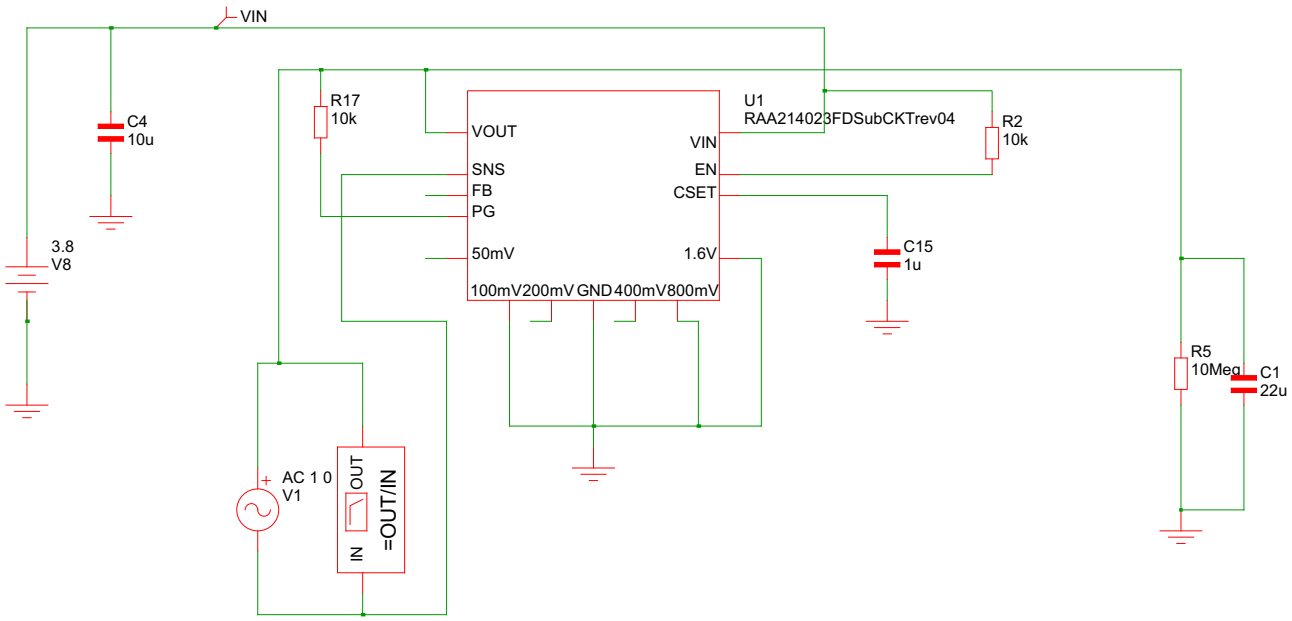

Figure 2. Gain Phase Test Setup with Sub-Circuit RAA214023FDSubCKTrev04

Note: All pins need to be connected on the SubCKT to avoid errors during net listing. Figure 3 shows the correct and incorrect connection of the RAA214023 output voltage programmed to 3.3V with the internal resistors. Pin 3, Pin 5, Pin 7, and Pin 9 are floating to achieve this. You must connect a wire to the floating pins.

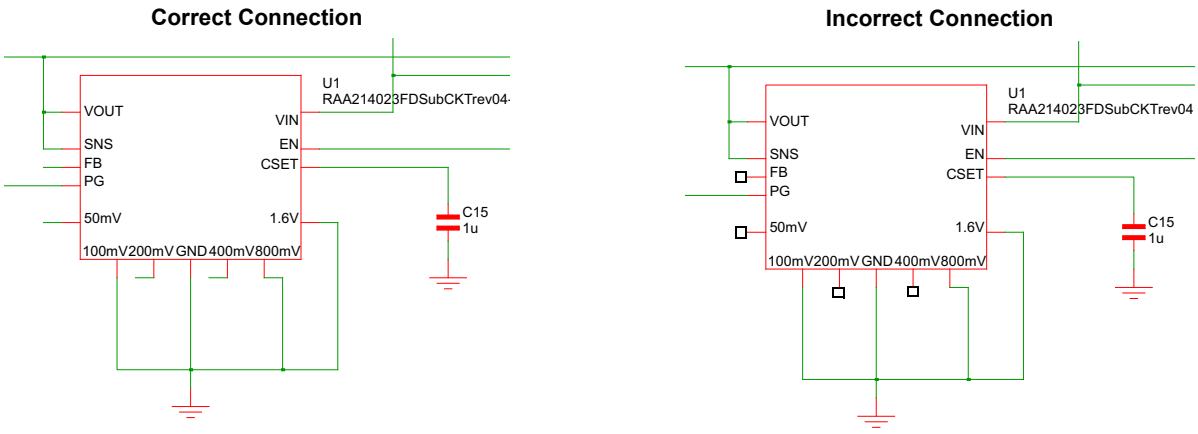

Figure 3. Floating Pins Need to be Connected

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4. Revision History

Revision	Date	Description
1.0	Jun 14, 2021	Initial release

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