RAA214020 SPICE Model

This document discusses the SPICE model for the RAA214020 LDO including the features supported and not supported by the model. To download the model, see the RAA214020 product page.

Contents

1. Model Features

This Pspice 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
- 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 (RAA214020 SPICE Model Validation.xlsx).
- Output current limit
- Enable and Disable function using the Enable pin
- Power-good using 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

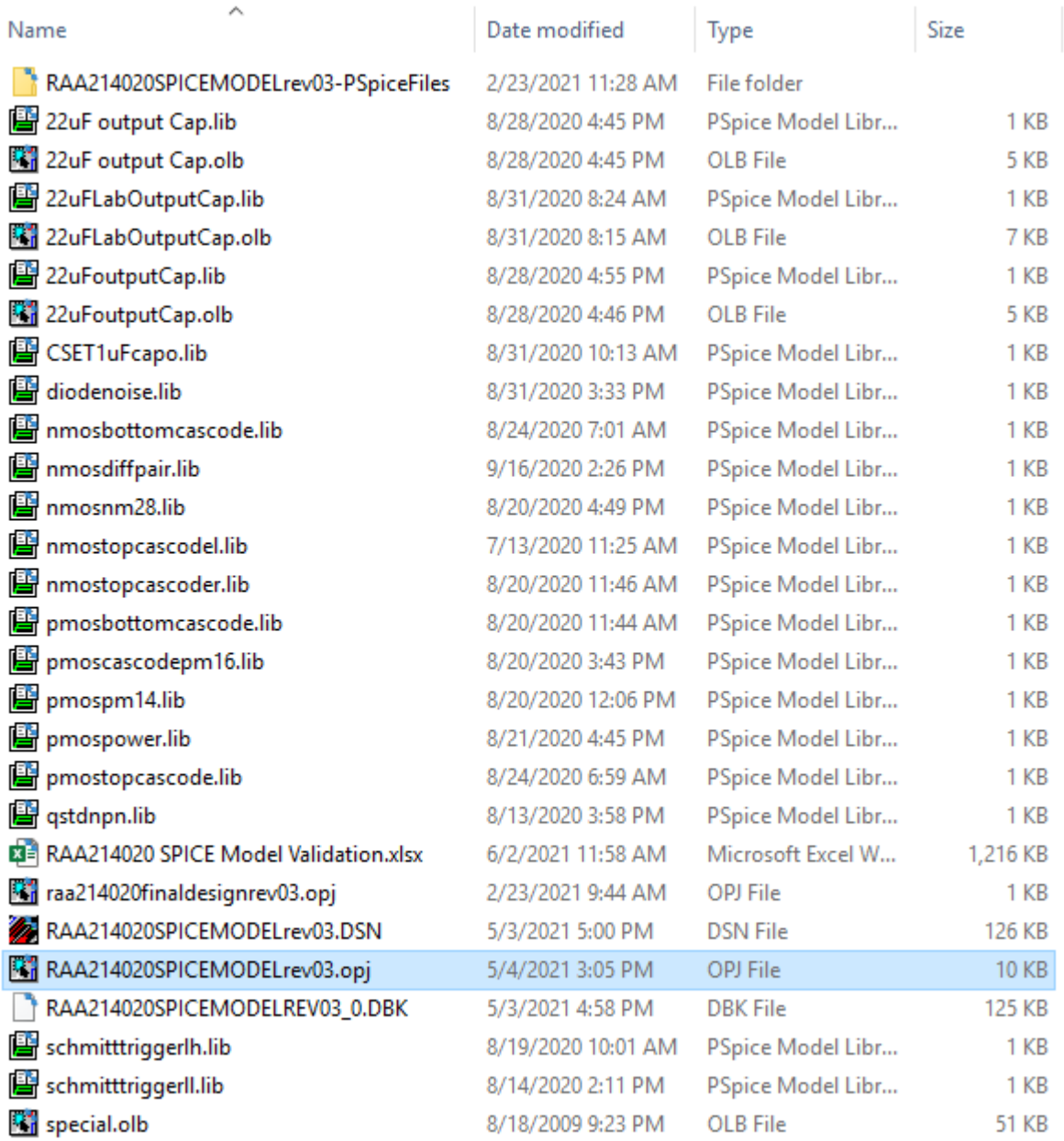
The following are the device performance features that are NOT supported by this model:

- 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 RAA214020 SPICE model software can be down loaded from the RAA214020 product page.

Save the file to a common directory for your SPICE simulations. This application note assumes you have a basic knowledge of running SPICE simulations. To open the software, click on the file titled **RAA214020SPICEMODELrev03.opj** (highlighted in Figure 1). An Excel spreadsheet is also provided documenting the validation of the model..



Name	Date modified	Type	Size
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22uF output Cap.olb	8/28/2020 4:45 PM	OLB File	5 KB
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schmitttriggerll.lib	8/14/2020 2:11 PM	PSpice Model Libr...	1 KB
special.olb	8/18/2009 9:23 PM	OLB File	51 KB

Figure 1. RAA214020 SPICE Model Software

The screen shown in Figure 2 appears. The test circuits for Noise, Gain Phase, PSRR, TransLoad, TransVIN, and TransVout are all setup. To run the different tests, click the down arrow and select the test you want to run (red arrow). You might need to right click on the specific test and **Make Root** to get it to run. To see the test setup, double click on **PAGE 1** and the schematic with the RAA214020 SubCKT appears. Figure 3 shows the Noise test circuit.

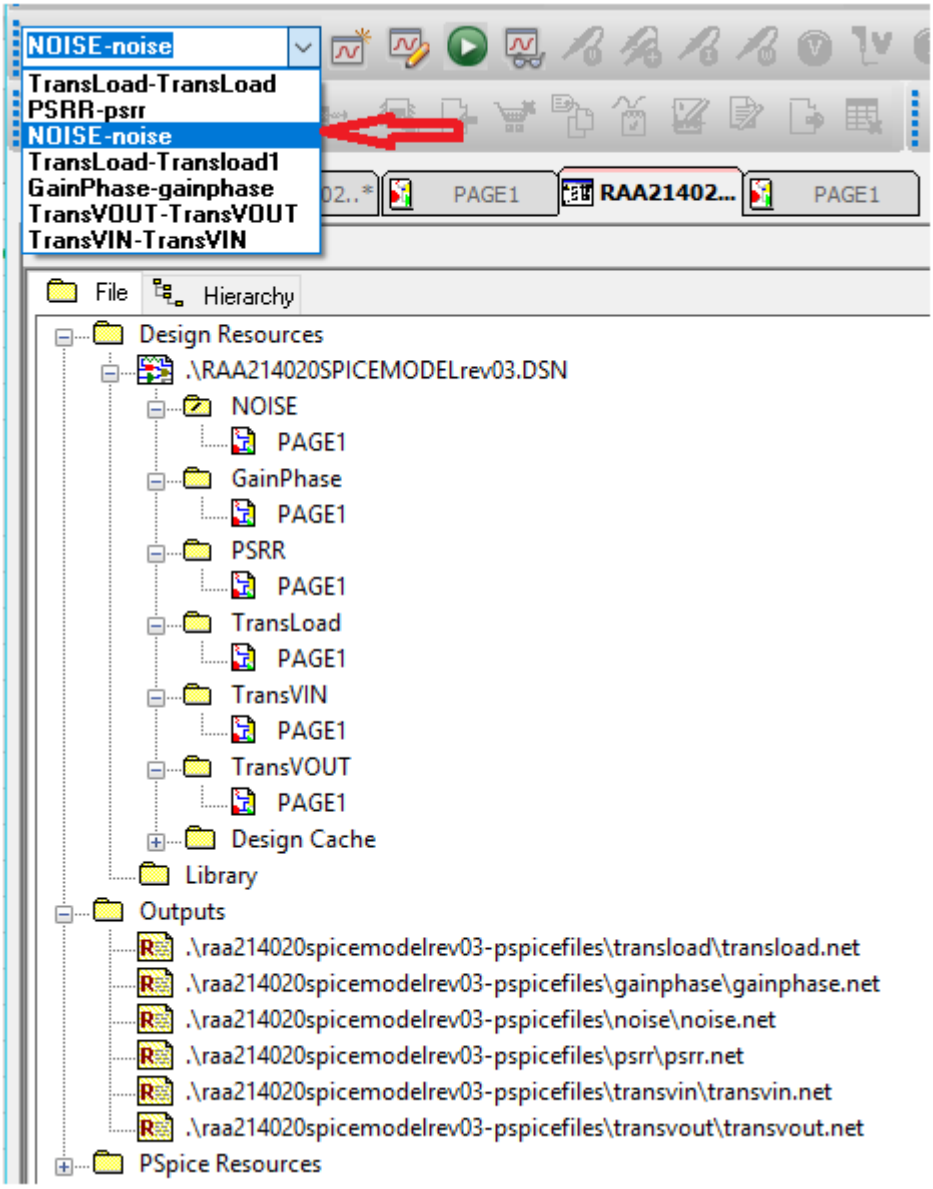

Figure 2. SPICE Software Test Selection Window

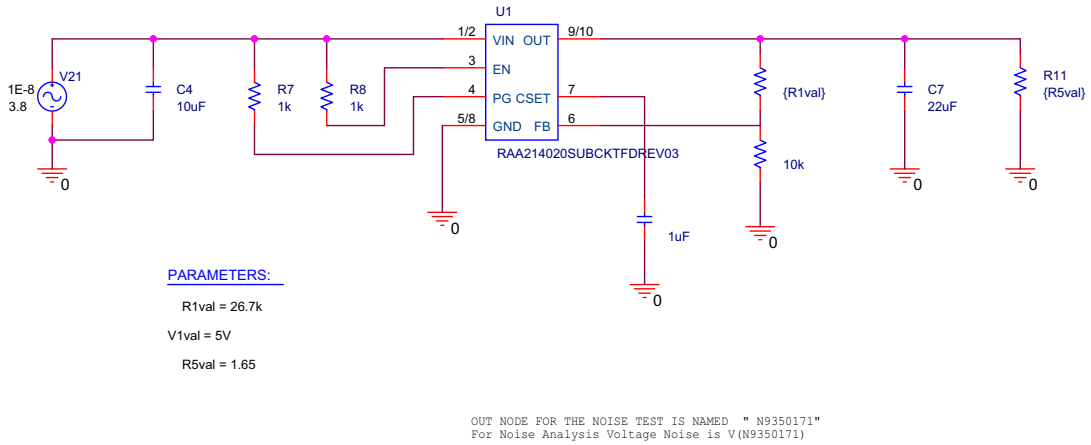

Figure 3. RAA214020SUBCKTFDREV03 Noise Test Circuit

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4. Revision History

Revision	Date	Description
1.0	Jun 18, 2021	Initial release.

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