Technical Support Record

Question or Problem	
Program	TINA
Category	Usage
Title	regulated power supply stability with practical capacitors
Question/Problem	Dear Ma'am/Sir, I have been trying to achieve decent stability in the regulated outputs of switching power regulators, but have been failing miserably. As long as I use ideal/generic capacitor models at the output (LC filter), it is perfectly stable. However, as soon as I replace the ideal/generic model with the device specific model provided by the respective manufacturers, the outputs get a lot glitchy, with sharp spikes all over the analysis duration. A detailed discussion over such occurrences can be found at https://e2e.ti.com/support/tools/sim-hw-system-design/f/234/p/909455/3370171 Request the TINA team to look into the affair and provide insights as to how stabilize the simulations with manufacturer-provided spice models of output capacitors. Looking forward to hearing back soon. Warm regards, Abbas Mehdi.
Answer/Solution	Hello Abbas We are not aware of such problems, especially just at changing a capacitor to non ideal. We need to see the circuit you created. Please send and we will look into it. Best regards Tibor
Additional file(s)	2020_Jun_15_webench_design_5172679_11.TSC 2020_Jun_15_webench_design_4756836_12014.TSC

Note	
Sender	Abbas Mehdi
Date	2020-06-15 09:15:58
Message	Hello Tibor. Thank you very much for responding to my inquiry. Please find the files for both the designs discussed in the aforementioned thread attached herewith. Also, please note that, in the design of TPS63050, the values of the inductor and capacitors might be changed from the original WEBENCH design. I was trying to optimize the design as per my requirement. However, the glitchy output is the same, whether the values used are as per the original WEBENCH design or my customized design. Looking forward to hearing back from you soon. Warm regards, Abbas Mehdi.

Note	
Sender	Abbas Mehdi
Date	2020-06-16 22:49:49
Message	Hello Tibor. Hope you are doing well.

It has been more than a day since I shared the design files. Were you able to have a look at it?

Looking forward to hearing back from you soon.

Warm regards,
Abbas Mehdi.

Note

Sender	Tibor Horvath
Date	2020-06-17 03:55:45
Message	Please be patient we'll contact you soon.

Note

Sender	Tibor Horvath
Date	2020-06-17 07:25:37
Message	We've checked your circuits and we think that the spikes are caused by the manufacturer inductor model you used, so you should keep the original model of Webench. There are small inducatances in the model and these inducatances generate the spikes. In the reality there are parazitic capacitances which smoothe the effect of such inductances but these are not handled in the simulator. If you are willing to pay we can develop a better model for you but the price of such a development is quite high more than 10k USD

Note

Sender	Abbas Mehdi
Date	2020-06-17 09:43:34
Message	Hello Tibor. Really appreciate your efforts and willingness to get our problem resolved. I am afraid your observation is partially correct. In the TPS62801YKA design, the problem starts with replacing the generic output inductor model with the manufacturer's, no matter which manufacturer I choose. Changing the output capacitor has no effect on the simulation, irrespective of the manufacturer. However, in the TPS63050YFF design, the problem starts with replacing the generic output capacitor model with the manufacturer's, no matter which manufacturer I choose. Changing the inductor has no effect on the simulation, irrespective of the manufacturer. The reason I mentioned both the devices in this thread is that the nature of fluctuations is the same. However, the spikes in the TPS63050YFF design are many folds larger than the ones in the TPS62801YKA design. Hope you would be able to suggest some measures to mitigate these effects. Looking forward to hearing back from you soon. Warm regards, Abbas Mehdi.

Note

Sender	Tibor Horvath
Date	2020-06-17 11:24:35
Message	Well, it's a modeling issue, not a simulator problem, so I do not think we can help you further...

New Note SEND

Sender Abbas Mehdi

Message	
Attach file *(max 2.00MB)*	Choose File No file chosen Upload

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