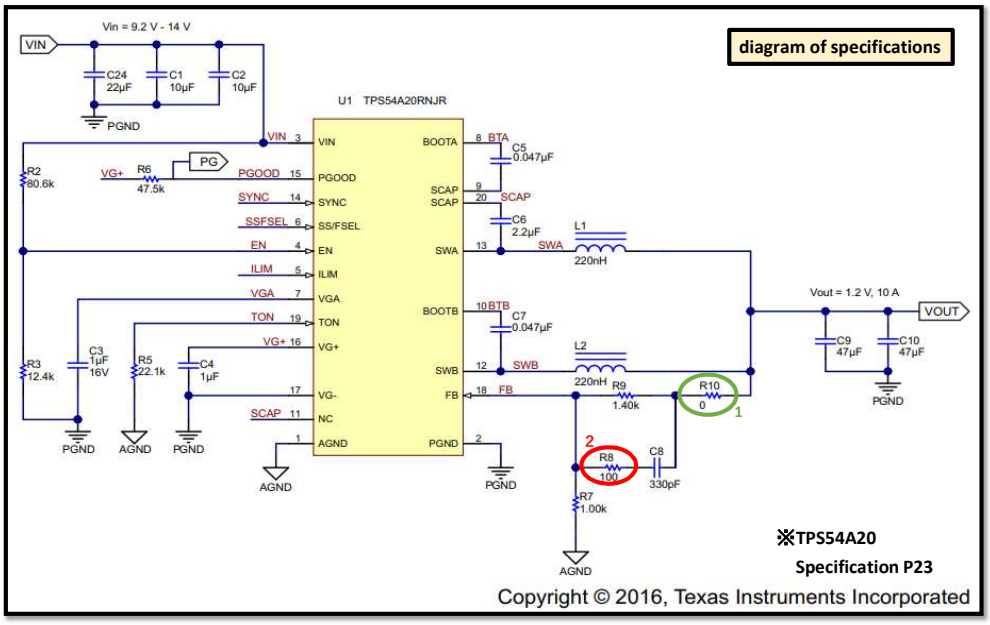

question

1. **It says in series with the FB pin, but is it about R9 or R10 in the diagram in the specification sheet, or is it the sum of them?**
2. **I understand the reason for choosing C8, but I would like to know the reason for choosing R8**

1

- The FB pin is sensitive to noise. The feedback resistors should be located as close as possible to the IC and routed with minimal lengths of trace. Place the feedback resistor network near the device to minimize the FB trace distance. When operating at 7 MHz or 10 MHz, a resistor (e.g. 10 kΩ) is required in series with the FB pin to reduce noise coupling and filter out high frequency noise as shown in Figure 62.

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simplified
If you want to drive at 7 or 10MHz, connect a resistor in series with the FB pin (eg 10kΩ)

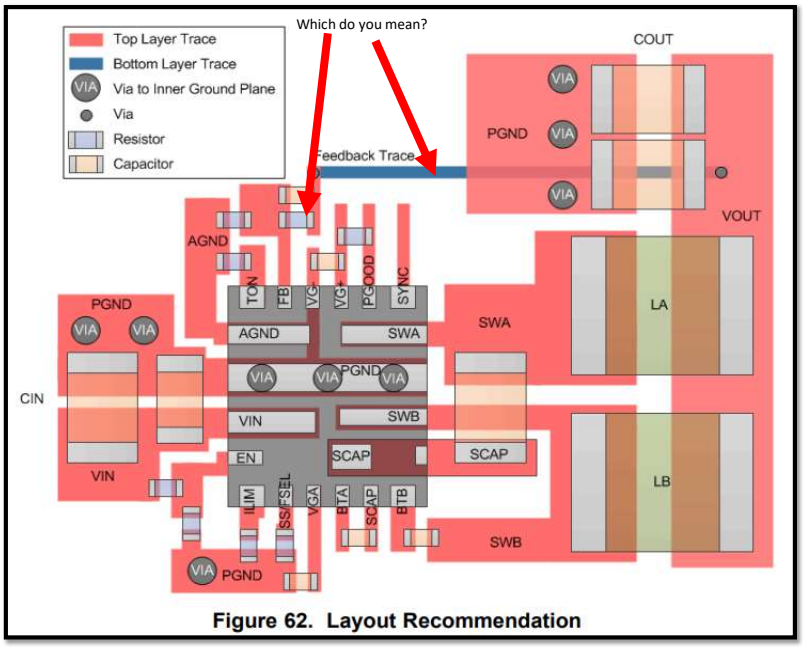

Figure 62. Layout Recommendation

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2

8.2.2.1 Output Voltage

Before beginning design, ensure that the series capacitor buck converter can be used in the application. It is recommended to use this converter when the minimum input voltage is at least five times greater than the target output voltage. If this recommendation is not followed, output voltage dropout can occur at heavy load conditions and poor transient response to load increases can result.

The output voltage is set by connecting a resistor divider network from the output voltage to the FB pin of the device and to AGND. It is recommended that the lower divider resistor maintain a range between 1 kΩ and 10 kΩ. To change the output voltage of a design, it is necessary to select the value of the upper resistor. The value of R_{TOP} for a specific output voltage can be calculated using Equation 2.

$$R_{(TOP)} = \frac{R_{(BOT)} \times (V_{OUT} - V_{REF})}{V_{REF}} \quad (2)$$

For the example design, 1 kΩ was selected for R_{BOT} (R7). Using Equation 2, R_{TOP} (R9) is calculated as 1.4 kΩ. It is recommended to use resistors with ±1% or less variation.

A capacitor can be connected in parallel with the upper resistor to provide additional phase boost near the converter's crossover frequency. See (SLVA289) for more details and design guidelines. For this design, 330 pF in series with 100 Ω is used. The values were optimized based on measured loop performance.

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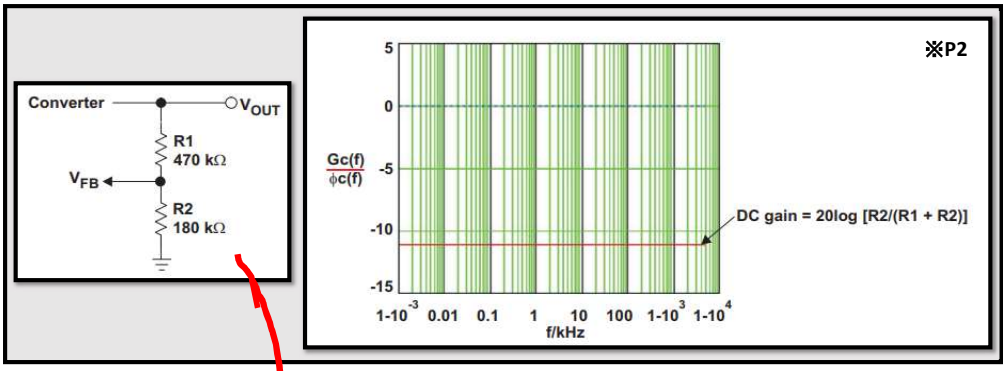
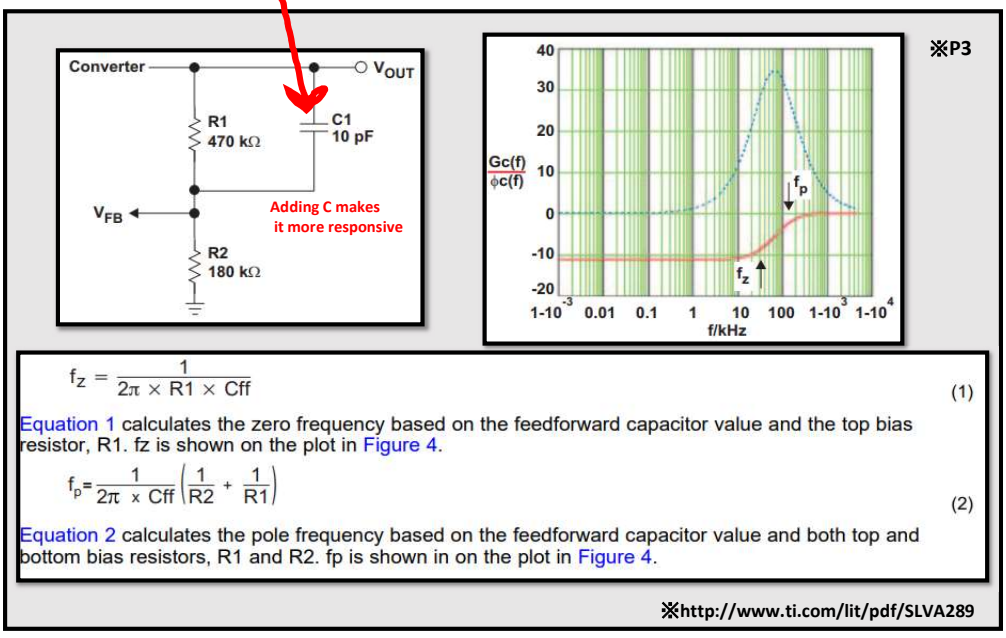
SLVA289 has more information about C regarding crossover frequencies.
330pF and 100Ω were selected for C8 and R8 this time.
Simplified

SLVA289 ※http://www.ti.com/lit/pdf/SLVA289





$$f_z = \frac{1}{2\pi \times R1 \times Cff} \quad (1)$$

Equation 1 calculates the zero frequency based on the feedforward capacitor value and the top bias resistor, R1. fz is shown on the plot in Figure 4.

$$f_p = \frac{1}{2\pi \times Cff} \left(\frac{1}{R2} + \frac{1}{R1} \right) \quad (2)$$

Equation 2 calculates the pole frequency based on the feedforward capacitor value and both top and bottom bias resistors, R1 and R2. fp is shown in on the plot in Figure 4.

※http://www.ti.com/lit/pdf/SLVA289