The RF layout is not dealing with voltage signals but power transfer to the antenna. To assume you can change to components without RF understanding of the signal path will result in unsuccessful radio transmission. Let me explain further.

The signals from RF\_N and RF\_P are 180 degrees out of phase. The phase which is derived from imaginary and real part of the specs found in the data sheet 70+j30 is the required load impedance to connected to pins (RF\_N and RF\_P). C251 & C261 provide some phase adjustment from the balun due to the small traces from the radios output pins. They also are used to block the radios dc levels on the pin.

The purpose of the balun is similar to digital frequency doublers only in this case we are doubling the amplitude of the signal at the summing point as seen below.



The balun made up of L251, C252, C262 and L261 has a certain output impedance that doesn’t match the antenna impedance. Therefore you must match using discrete components. The traces layout traces are component values also at 2.45GHz. So you must either copy them exactly as our reference design with the same layer stack up or hire an RF engineer who can adjust your new layout traces appropriately. This is covered in microwave layout design course or books for engineers on microstrip layout. As quick example is shown below where each of the dark lines are traces and the component values given. The point here is you will change the performance if you make changes to the components or layout. This is circuits 101 for RF design engineer please make sure you take the necessary steps.











After this I probably scared you completely or you understand the importance of the change to the layout. Below are copies of the schematic but you must also pay attention to the boards layout from TI’s EVM especially the layer stacking. If you follow all this you will have a working system equal to the TI evaluation board.





