This work describes the design, analysis and fabrication of a 24-GHz microwave single balanced down-conversion mixer based on Schottky diode, hybrid ring coupler and a wide and deep stopband low-pass filter (LPF). The LPF is composed of three uniform defected ground structures along with a compensated microstrip line. The selected frequencies are 24.125 GHz for RF signal and 24 GHz for LO signal. When the LO and RF signals are injected as 10 dBm and 0 dBm respectively, a conversion loss of 12.85 dB with an LO-to-RF isolation greater than 38 dB is obtained. The measured results agree well with the simulated results and the reported design