A high-speed Schottky detector for ultra-wideband communications

This letter reviews the design procedure of a high-speed Schottky video detector for high-data-rate communications within the ultra-wideband (UWB) frequencies. The classic design approach for video detectors is extended with a mixer-like analysis, which results in a more detailed assessment of the detector performance. The designed circuit is reviewed and measurements are provided for a manufactured prototype. The detector can successfully demodulate 2.5 Gbps video signals around a 7 GHz carrier. The bitrate to carrier frequency ratio of 35.7% is the highest reported for detectors at UWB frequencies. Using 0 dBm carrier power, the lowest measured conversion loss is 10 dB for a video frequency of 1.1 GHz and better than 13 dB up to 1.8 GHz.

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