HIGH DEFINITION VIDEO TRANSMISSION USING TERAHERTZ COMMUNICATION LINE

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The terahertz (THz) frequency range (0.1 to 10 THz) is in the process of becoming interesting for data transmission applications due to increasing bandwidth requirements and spectrum congestion in microwave range. Advancing THz range emission and detection devices [1] pave way for efficient THz generation and detection. Higher carrier frequencies are expected to result in higher data rates [1], thus making communications a promissing field for THz frequencies.

The aim of this work is to develop reliable, real-time high definition video transmission line using 0.25 THz fully-electronic wireless link. The implemented point-to-point one way (simplex) wireless THz communication line schematic is shown in Fig. 1. Video file is encoded using FFMPEG framework in sender device, after that encoded bits of video are transferred to Prolific PL2303GC USB-TTL converter through device USB port. USB-TTL converter generates serial digital data bitstream, which, in turn, is routed to the THz source for signal generation. After that, digital data caught by THz detector is digitized by another USB-TTL converter, decoded and displayed on the screen of the receiving device.

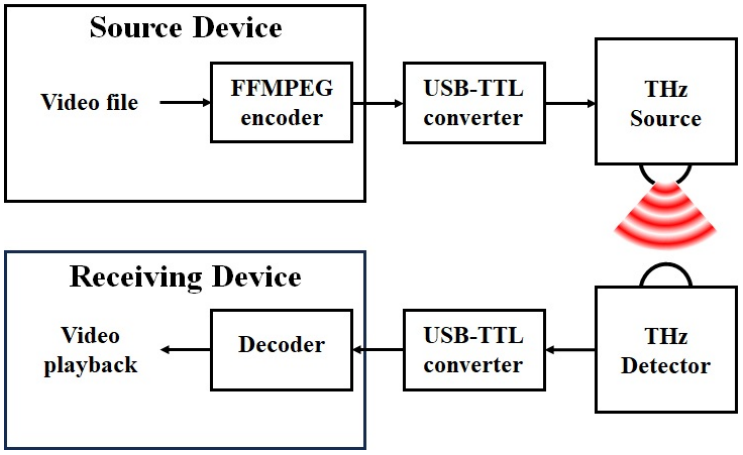

Fig. 1. THz communication line diagram

[1] Ikamas, K.; But, D.B.; Cesiul, A.; Kołaciński, C.; Lisauskas, T.; Knap, W.; Lisauskas, A. All-Electronic Emitter-Detector Pairs for 250 GHz in Silicon. Sensors 2021, 21, 5795. https://doi.org/10.3390/s21175795