Abstracts

A wireless spread-spectrum communication system using SAW chirped delay lines

A. Springer, W. Gugler, M. Huemer, R. Koller and R. Weigel. "A wireless spread-spectrum communication system using SAW chirped delay lines." 2001 Transactions on Microwave Theory and Techniques 49.4 (Apr. 2001, Part II [T-MTT] (Special Issue on Microwave Acoustic Wave Devices for Wireless Communications and Sensing)): 754-760.

We report on the use of broad-band chirp signals for spread-spectrum communications in indoor and industrial environments. The well-known pulse compression technique associated with chirp signals is exploited to achieve a highly robust communication system. For the generation and compression of the chirp signals, surface acoustic wave delay lines fabricated from an LiTaO/sub 3/-X112rotY substrate are used. Center frequency, bandwidth, chirp duration, and chirp rate are 348.8 MHz, 80 MHz, 500 ns, and /spl plusmn/40 MHz//spl mu/s, respectively. Different modulation schemes for chirp signals are introduced, the effects of nonlinearities, frequency drift, and temperature drift are addressed, and simulations and measurement results from a hardware demonstrator are presented for the use of /spl pi//4-differential quadrature phase-shift keying (DQPSK) modulation. A data rate of up to 40 Mb/s has been achieved experimentally and shows that the proposed system is highly robust against multipath effects.

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