

Implementation of the expert decision system for environmental assessment in composite materials selection for automotive components

ABSTRACT

Orthogonal frequency division multiplexing systems suffer from one main drawback which is a high peak-to-average power ratio (PAPR) that leads to power efficiency degradation and when feed to a power amplifier operating in the nonlinear region yields adjacent channel interference and inferior bit error rate performance. There are many methods to overcome this drawback, one example of which is partial transmit sequence (PTS). Here implementation of a proposed PTS on field programmable gate array platform to show the feasibility of the PAPR reduction scheme is carried out. It has been shown that the proposed PTS scheme is significantly simpler as compared to the conventional methods and integration of this scheme with digital pre-distortion technique improves the system efficiency, suppressed out-of-band distortion and hence, prolong battery life. The simulations have been carried out with QPSK modulation and inverse fast Fourier transform with 512 subcarriers. The implementation results show in average 21% reduction in hardware resource and almost 18% conservation in total power consumption by applying the new PTS scheme while its PAPR performance remains comparable to the conventional PTS method.

Keyword: CCDF; OFDM; Partial transmit sequence; PAPR; FPGA