

Low PAPR Sequences for the 802.16a Preamble

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$N_s=256$

For $N_s=256$,

$S_1 = [\{28 \text{ 0's}\} \begin{matrix} 1 & -1 & 1 & 1 & 1 & -1 & -1 & -1 & -1 & -1 & 1 & -1 & -1 & -1 & 1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & 1 & -1 & -1 & -1 & 1 & -1 & 1 & 1 & 1 & -1 & -1 & -1 & -1 & -1 & -1 \\ 1 & 1 & -1 & 1 & 1 & -1 & -1 & 1 & -1 & -1 & 1 & 1 & -1 & -1 & 1 & -1 & -1 & 1 & -1 & -1 \\ 1 & 1 & 1 & 1 & 1 & -1 & -1 & -1 & 1 & 1 & 1 & -1 & -1 & 1 & 1 & 1 & 1 & 1 & -1 & -1 & - \\ 1 & 1 & -1 & -1 & 1 & -1 & 1 & -1 & 1 & -1 & 1 & -1 & 1 & 1 & -1 & 1 & -1 & 1 & -1 & 1 & - \\ 1 & -1 & -1 & 0 & -1 & -1 & 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 & 1 & -1 & 1 & -1 & 1 & 1 \\ 1 & 1 & 1 & -1 & 1 & -1 & 1 & -1 & -1 & 1 & -1 & -1 & 1 & 1 & 1 & -1 & -1 & -1 & -1 & 1 & - \\ 1 & -1 & -1 & 1 & -1 & 1 & -1 & -1 & -1 & -1 & -1 & -1 & 1 & -1 & 1 & -1 & 1 & 1 & 1 & -1 & - \\ 1 & 1 & 1 & -1 & 1 & -1 & 1 & -1 & 1 & -1 & -1 & 1 & 1 & 1 & -1 & -1 & -1 & -1 & 1 & 1 & - \\ 1 & 1 & 1 & 1 & -1 & 1 & -1 & 1 & 1 & -1 & -1 & -1 & -1 & 1 & -1 & -1 & 1 & 1 & -1 & -1 & - \\ 1 & 1 & 1 & \{27 \text{ 0's}\} \end{matrix}] - \text{PAPR of 3.06 or 4.85 dB.}$

$N_s=128$

For $N_s=128$,

$S_1 = [\{14 \text{ 0's}\} \ 1 \ -1 \ 1 \ 1 \ 1 \ -1 \ 1 \ 1 \ -1 \ -1 \ -1$

$1 \ -1 \ 1 \ 1 \ -1 \ -1 \ -1 \ 1 \ -1 \ -1 \ 1 \ -1 \ -1 \ -1 \ 1 \ 1 \ 1 \ -1$

$-1 \ -1 \ 1 \ 1 \ -1 \ 1 \ 1 \ -1 \ -1 \ -1 \ -1 \ -1 \ 1 \ 1 \ 1 \ 1 \ -1 \ 1$

$1 \ 1 \ -1 \ 0 \ -1 \ -1 \ 1 \ -1 \ -1 \ -1 \ -1 \ 1 \ -1 \ -1 \ 1 \ 1 \ -1 \ 1$

$-1 \ 1 \ 1 \ -1 \ -1 \ 1 \ -1 \ 1 \ -1 \ -1 \ 1 \ -1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1$

$1 \ 1 \ -1 \ -1 \ -1 \ 1 \ -1 \ 1 \ -1 \ -1 \ 1 \ -1 \ -1 \ -1 \ -1 \ -1 \ -1$

$1 \ -1 \ \{13 \text{ 0's}\}]$ – PAPR of 2.63 or 4.19 dB.

$$\underline{N_s=64}$$

For $N_s=64$,

$$S_1 = [\{7 \text{ 0's}\} \begin{matrix} -1 & 1 & 1 & 1 & 1 & -1 & 1 & 1 & 1 & -1 & -1 & 1 & 1 & -1 \\ 1 & -1 & -1 & 1 & -1 & 1 & -1 & -1 & -1 & 1 & -1 & 0 & 1 & 1 & -1 & 1 & -1 \\ 1 & -1 & 1 & 1 & -1 & 1 & 1 & 1 & -1 & -1 & -1 & -1 & 1 & 1 & 1 & -1 & 1 \\ -1 & -1 & 1 & \{6 \text{ 0's}\} \end{matrix}] - \text{PAPR of 2.113 or 3.24 dB}$$

$$\underline{N_s=32}$$

For $N_s=32$,

$S_1 = [\{4 \text{ 0's}\} \ 1 \ 1 \ -1 \ -1 \ 1 \ 1 \ 1 \ 1 \ 1 \ 1 \ -1 \ 1 \ 0 \ 1 \ -1$
 $\ -1 \ -1 \ 1 \ -1 \ -1 \ 1 \ -1 \ 1 \ 1 \ -1 \ \{3 \text{ 0's}\}]$ – PAPR of
1.72 or 2.35 dB.

$$\underline{N_s=16}$$

For $N_s=16$,

$$S_1=[0 \ 0 \ 1 \ 1 \ 1 \ -1 \ -1 \ -1 \ 0 \ 1 \ -1 \ -1 \ 1 \ -1 \ -1 \ 0] -$$

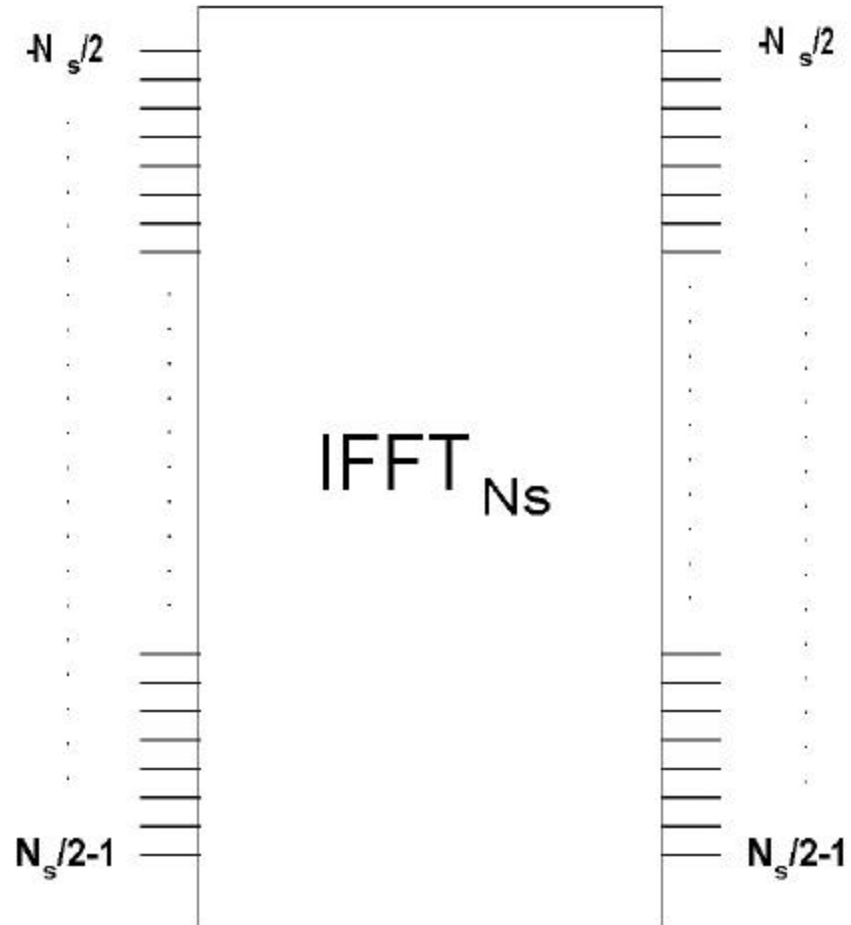
PAPR of 1.5957 or 2.02 dB.

N=256, Sequence that results in 4X64 after a 256-point IFFT

For $N_s=256$,

$S_1 = \sqrt{2} * [\{28 \text{ 0's}\} -1+j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0 \ 0 \ 1-j \ 0$
 $0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ -1+j$
 $0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0 \ 0$
 $1-j \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0 \ 0$
 $-1-j \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0$
 $0 \ -1-j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0$
 $0 \ 1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ -1-j \ 0$
 $0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ 1-j$
 $0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0$
 $1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ -1-j \ 0 \ 0 \ 0 \ 1-j \ 0 \ 0$
 $0 \ 1+j \ 0 \ 0 \ 0 \ 1+j \ 0 \ 0 \ 0 \ -1+j \ 0 \ 0 \ 0 \ 1+j \ \{27 \text{ 0's}\} - \text{PAPR}$
 of 2.451 or 3.89 dB

Sequence formation



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