

CLAIMS:

1. A communication device, wherein the communication device is used to transmit a physical layer protocol data unit, PPDU, to one or more receiving devices and the PPDU comprises a universal signal, U-SIG, field, and wherein the U-SIG field comprises disregard bits, comprising a processor, configured to:

operate on a first disregard bits sequence of the disregard bits to obtain a second disregard bits sequence, wherein the first disregard bits sequence is with all bits set to '1', and the second disregard bits sequence comprises at least one binary '0', by setting the value of the first disregard bits sequence to a sequence comprising at least one '0' bit; and

a transmitter, configured to: transmit the PPDU, wherein the disregard bits in the U-SIG field of the PPDU comprises the second disregard bits sequence.

2. The communication device according to claim 1, wherein the U-SIG comprises at least a first U-SIG symbol and a second U-SIG symbol.

3. The communication device according to claim 1 or 2, wherein setting the value of the first disregard bits sequence to a sequence comprising at least one '0' bit comprises:

setting the first disregard bits sequence of MU PPDU to one of the sequence in the set {'00101', '00110', '01001', '01111', '10011', '10101', '11000', '10110'}; or

setting the first disregard bits sequence of TB PPDU for the first U-SIG symbol to one of the sequence in the set {'010010', '010011', '010100', '010101', '011100', '011101', '011110', '011111', '100101', '100010', '110100', '111000', '111001'}; or

setting the first disregard bits sequence of TB PPDU for the second U-SIG symbol to one of the sequence in the set {'01001', '01101', '01111', '11010', '11011', '11101', '11110', '11111'}; or

setting a single global value of the first disregard bits sequence within the first U-SIG symbol for different BW values for a TB PPDU, and the first disregard bits sequence is in particularly set as '011110' in binary; or

setting a single global value of the first disregard bits in the second U-SIG symbol for different bandwidth values for a TB PPDU, and the first disregard bits sequence is in particularly set as '01001' or '11110' in binary.

4. The communication device according to claim 3, wherein setting the value of the first disregard bits sequence of MU PPDU to one of the sequence in the set {'00101', '00110', '01001', '01111', '10011', '10101', '11000', '10110'} comprises:

the first disregard bits sequence is set to '00101' when the PPDU is transmitted over 20MHz bandwidth; or

the first disregard bits sequence is set to one of {'00101', '00110', '01001', '01111', '10011'} when the PPDU is transmitted over 40MHz bandwidth; or

the first disregard bits sequence is set to one of {'00101', '01111', '10011', '11000'} when the PPDU is transmitted over 80MHz bandwidth; or

the first disregard bits sequence is set to one of {'00101', '10101'} when the PPDU is transmitted over 160MHz bandwidth; or

the first disregard bits sequence is set to one of {'00101', '10110'} when the PPDU is transmitted over 320MHz bandwidth; or

the first disregard bits sequence is set to '00101' for any bandwidth;

and

wherein setting the first disregard bits sequence of TB PPDU for the first U-SIG symbol to one of the sequence in the set {'010010', '010011', '010101', '011100', '011101', '011110', '011111', '100101', '100010', '110100', '111000', '111001'} comprises:

the first disregard bits sequence of TB PPDU for the first U-SIG symbol is set to one of the sequence in the set {'010010', '010011', '010101', '011100', '011101', '011110', '011111', '100101', '100010', '110100', '111000', '111001'}, the first disregard bits sequence of TB PPDU for the second U-SIG symbol is copied from trigger frame;

and

wherein set the first disregard bits sequence of TB PPDU for the second U-SIG symbol to one of the sequence in the set {'01001', '01101', '01111', '11010', '11011', '11101', '11110', '11111'} comprises:

the first disregard bits sequence of TB PPDU for the second U-SIG symbol is set to one of the sequence in the set {'01001', '01101', '01111', '11010', '11011', '11101', '11110', '11111'}, and the first disregard bits sequence of TB PPDU for the first U-SIG symbol is set to '011110' in binary.

5. The communication device according to anyone of preceding claims, the PPDU comprises: multi-user, MU, PPDU, or trigger-based, TB, PPDU.

6. A method of reducing peak to average power ratio, PAPR, for transmitting a physical layer protocol data unit, PPDU, wherein the PPDU comprises a universal signal, U-SIG, field, and wherein the U-SIG field comprises disregard bits, comprising:

operating on a first disregard bits sequence of the disregard bits to obtain a second disregard bits sequence, wherein the first disregard bits sequence is with all bits set to '1', and the second disregard bits sequence comprises at least one binary '0', by setting the value of the first disregard bits sequence to a sequence comprising at least one '0' bit; and

transmitting the PPDU, wherein the disregard bits in the U-SIG field of the PPDU comprises the second disregard bits sequence.

7. The method according to claim 6, wherein the U-SIG comprises at least a first U-SIG symbol and a second U-SIG symbol.

8. A non-transitory machine-readable storage medium having stored thereon processor-executable instructions, which when executed by a processor of a communication device, cause the communication device to implement a method for reducing peak to average power ratio, PAPR, for transmitting a physical layer protocol data unit, PPDU, as claim 6 or 7.

9. A computer program product comprising a non-transitory computer-readable storage medium having computer-readable instructions stored thereon, the computer-readable instructions being executable by a computerized device comprising processing hardware to execute a method of claim 6 or 7.