[0007] In a first aspect, the present disclosure provides a communication apparatus comprising: circuitry which, in operation, is configured to allocate one or more additional operating window(s) between a first operating window and a second operating window for a reception or a transmission of a sidelink signal; and a transceiver which, in operation, transmit or receive a sidelink signal within the one or more additional operating window, wherein a time duration of the one or more additional operating window(s) is configured by at least one of a higher layer signalling or a fixed value.

[0008] In a second aspect, the present disclosure provides a communication method comprising: allocating one or more additional operating window(s) between a first and a second operating window(s) for a reception or a transmission of a sidelink signal; and transmitting or receiving a sidelink signal within the one or more additional operating window, wherein a time duration of the one or more additional operating window(s) is configured by at least one of a higher layer signalling or a fixed value.

[0008a] In a third aspect, the present disclosure provides an integrated circuit, which, in operation, causes a user equipment (UE) to carry out the steps of: allocating one or more additional operating window(s) between a first and a second operating window(s) for a reception or a transmission of a sidelink signal; and transmitting or receiving a sidelink signal

within the one or more additional operating window, wherein a time duration of the one or more additional operating window(s) is configured by at least one of a higher layer signalling or a fixed value.

[0009] Additional benefits and advantages of the disclosed embodiments will become apparent from the specification and drawings. The benefits and/or advantages may be individually obtained by the various embodiments and features of the specification and drawings, which need not all be provided in order to obtain one or more of such benefits and/or advantages.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views and which together with the detailed description below are incorporated in and form part of the specification, serve to illustrate various embodiments and to explain various principles and advantages in accordance with present embodiments.

CLAIMS

1. A communication apparatus comprising:

circuitry which, in operation, is configured to allocate one or more additional operating window(s) between a first operating window and a second operating window for a reception or a transmission of a sidelink signal; and

a transceiver which, in operation, transmit or receive a sidelink signal within the one or more additional operating window,

wherein a time duration of the one or more additional operating window(s) is configured by at least one of a higher layer signalling or a fixed value.

2. The communication apparatus of claim 1, wherein the circuitry is further configured to monitor a physical downlink control channel (PDCCH) within the first operating window and the second operating window.

3. The communication apparatus of claim 1 or 2, wherein the one or more additional operating window(s) is a contiguous operating window extended from an end of the first operating window and/or a start of the second operating window.

4. The communication apparatus of claim 3, wherein the circuitry is further configured set a length of the contiguous operating window based on a length of a sensing window, a portion of the sensing window falls between the end of the first operating window and the start of the second operating window.

5. The communication apparatus of claim 4, wherein the transceiver is configured to only receive a sidelink signal within the contiguous operating window.

6. The communication apparatus of claim 1 or 2, wherein the circuitry is further configured to:

determine if a duration between one of (i) a transmission trigger slot within the first operating window and the end of the first operating window, (ii) a transmission trigger slot within the second operating window and the start of the second operating window, (iii) a reception of a negative acknowledgement signal and the end of the first operating window, and (iv) an unsuccessful decoding event of a received sidelink signal and the end of the first operating window is less than a threshold duration, and the circuitry is configured to allocate the contiguous operating window based on a result of the determination respectively.

7. The communication apparatus of claim 3, wherein the circuitry is configured to allocate the contiguous operating window based on a parameter relating to at least one of a number of consecutive failed receptions, a time period without a successful transmission, a time period without a successful reception, a successful transmission ratio and a successful reception ratio.

8. The communication apparatus of claim 3, wherein the circuitry is further configured to set a length of the contiguous operating window extended from the second operating window based on a value of a timer and one of the start of the second operating window and a trigger slot within the second operating window.

9. The communication apparatus of claim 3, wherein the circuitry is further configured to set a length of the contiguous operating window extended from the first operating window based on a value of a timer and one of the end of the first operating window and a trigger slot within the first operating window.

10. The communication apparatus of claim 8, wherein the circuitry is configured to set a value of the timer for each of a plurality of power-saving modes of the communication apparatus.

11. The communication apparatus of claim 3, wherein the circuitry is configured to set a length of the contiguous operating window that is gradually incremented or decremented from at least one preceding contiguous operating window allocated prior to the contiguous operating window and/or at least one subsequent contiguous operating window subsequent to the contiguous operating window.

12. The communication apparatus of claim 3, wherein the circuitry is configured to further extend a length of the contiguous operating window after an end of the first operating window until the circuitry is determined that a physical sidelink feedback channel (PSFCH) or an acknowledgement signal has been transmitted/received to/from another communication apparatus or at least one of a successful transmission of a signal, a successful reception of a signal and a successful decoding event has been completed.

13. The communication apparatus of claim 1 or 2, wherein the one or more additional operating window(s) comprises one or more discrete operating windows separated from an end of the first operating window and a start of the second operating window, and the

circuitry is configured to allocate the one or more discrete operating window(s) based on a bitmap.

14. The communication apparatus of claim 12, wherein the circuity is configured to apply the bitmap corresponding to one of a plurality of power-saving modes of the communication apparatus.

15. The communication apparatus of claim 12, wherein the circuitry is configured to further allocate a redundant operating window extended from one of the one or more discrete operating window based on a time required for a state transition in one of a plurality of power states of the communication apparatus.

16. The communication apparatus of claim 1, wherein the transceiver further receives a signal during the first operating window or an operating window therebefore; and the circuity is configured to allocate the one or more additional operating window based on the received signal.

17. The communication apparatus of claim 16, wherein the signal is one of a first stage Sidelink Control Information (SCI), a second stage SCI, a Downlink Control Information (DCI), a Radio Resource Control (RRC) message, a PSFCH and a Media Access Control (MAC) Control Element (CE).

18. A communication method comprising:

allocating one or more additional operating window(s) between a first and a second operating window(s) for a reception or a transmission of a sidelink signal; and

transmitting or receiving a sidelink signal within the one or more additional operating window,

wherein a time duration of the one or more additional operating window(s) is configured by at least one of a higher layer signalling or a fixed value.

19. An integrated circuit, which, in operation, causes a user equipment (UE) to carry out the steps of:

allocating one or more additional operating window(s) between a first and a second operating window(s) for a reception or a transmission of a sidelink signal; and

transmitting or receiving a sidelink signal within the one or more additional operating window,

wherein a time duration of the one or more additional operating window(s) is configured by at least one of a higher layer signalling or a fixed value.