

SCell. Therefore, not only when PCell is DL heavy but also when PCell is neither DL heavy nor UL heavy (FIG. 10B), the maximum number of DL HARQ processes which is actually required in SCell becomes greater than the maximum number of DL HARQ processes defined in the UL-DL configuration set in SCell. Thus, problems similar to those described above exist also when PCell is neither DL heavy nor UL heavy.

[0075] As described above, when SCell references PDSCH-PUCCH timings defined in a UL-DL configuration which is DL heavier than the UL-DL configuration set in SCell, there is a case where the IR buffer is not allocated to some DL HARQ processes and it is not possible to obtain any coding gain through HARQ retransmission.

[0076] Embodiments An object of the present invention is to provide a terminal apparatus and a buffer dividing method capable of obtaining a coding gain by HARQ for all DL HARQ processes even when a UL-DL configuration differs among a plurality of component carriers.

#### Solution to Problem

[0076a] According to a first aspect, there is provided a terminal apparatus which, in operation, communicates with a base station apparatus using a plurality of component carriers including at least a first component carrier and a second component carrier, the terminal apparatus comprising: a decoder which, in operation, stores, in a retransmission buffer, first and second downlink data respectively received in the first and second component carriers, wherein a first configuration pattern of uplink and downlink subframes is set for the first component carrier and a second configuration pattern of uplink and downlink subframes is set for the second component carrier; determines a reference configuration pattern of uplink and downlink subframes based on the first and second configuration patterns; stores the second downlink data in the retransmission buffer in reference to a maximum number of downlink HARQ (hybrid automatic repeat request) retransmission processes executable in the determined reference

configuration pattern; and decodes the first and second downlink data; a signal generator which, in operation, generates a first response signal using a result of error detection of the first downlink data and a second response signal using a result of error detection of the second downlink data; and a transmitter which, in operation, transmits the first and second response signals in the first component carrier.

[0076b] According to a second aspect, there is provided a method implemented in a terminal apparatus configured to communicate with a base station apparatus using a plurality of component carriers including at least a first component carrier and a second component carrier, the method comprising steps of: storing, in a retransmission buffer, first and second downlink data respectively received in the first and second component carriers, wherein a first configuration pattern of uplink and downlink subframes is set for the first component carrier and a second configuration pattern of uplink and downlink subframes is set for the second component carrier, determining a reference configuration pattern of uplink and downlink subframes based on the first and second configuration patterns and storing the second downlink data in the retransmission buffer in reference to a maximum number of downlink HARQ (hybrid automatic repeat request) retransmission processes executable in the determined reference configuration pattern, decoding the first and second downlink data, generating a first response signal using a result of error detection of the first downlink data and a second response signal using a result of error detection of the second downlink data, and transmitting the first and second response signals in the first component carrier.

[0077] Disclosed herein ~~A terminal apparatus according to an aspect of the present invention~~ is an apparatus which communicates with a base station apparatus using a plurality of component carriers and for which a configuration pattern of subframes included in one frame is set for each of the plurality of component carriers, the configuration pattern including a downlink communication subframe used for downlink communication and an uplink communication subframe used for uplink communication, the terminal apparatus including: a decoding section that stores, in a retransmission buffer, downlink data transmitted in each of the plurality of component carriers and decodes the downlink data; a generating section that generates a response signal using a result of error detection of the downlink data; and a transmitting section that transmits, using a first component carrier of the plurality of component carriers, a response signal for first downlink data received using the first component carrier and a response signal for second downlink data received using a second component carrier of the plurality of component carriers,

in which: the buffer includes a first buffer that stores the first downlink data and a second buffer that stores the second downlink data; and the second buffer is divided into regions respectively corresponding to retransmission processes based on a specific value determined by a combination of a first configuration pattern that is set in the first component carrier and a second configuration pattern that is set in the second component carrier.

[0078] ~~Disclosed herein~~A buffer dividing method according to an aspect of the present invention is a method for a terminal apparatus which communicates with a base station apparatus, using a plurality of component carriers and in which a configuration pattern of subframes included in one frame is set for each of the plurality of component carriers, the configuration pattern including a downlink communication subframe used for downlink communication and an uplink communication subframe used for uplink communication, the method including: storing, in a retransmission buffer, downlink data transmitted in each of the plurality of component carriers; decoding the downlink data; generating a response signal using a result of error detection of the downlink data; and transmitting, using a first component carrier of the plurality of component carriers, a response signal for first downlink data received in the first component carrier and a response signal for second downlink data received in a second component carrier of the plurality of component carriers, in which: the buffer includes a first buffer that stores the first downlink data and a second buffer that stores the second downlink data; and the second buffer is divided into regions respectively corresponding to retransmission processes based on a specific value determined by a combination of a first configuration pattern that is set in the first component carrier and a second configuration pattern that is set in the second component carrier.

#### Advantageous Effects of Invention

[0079] According to embodiments of the present invention, it is possible to obtain a coding gain by HARQ for all DL HARQ processes even when a UL-DL configuration differs among a plurality of component carriers.