CLAIMS

1. A terminal device, comprising:

transmission circuitry configured and/or programmed to transmit a Rank Indicator (RI) for Physical Downlink Shared CHannel (PDSCH) transmission;

reception circuitry configured and/or programmed to receive first information used for determining first maximum number of layers being the first maximum number assumed for determining a bit width for the RI and to receive a transport block on the PDSCH; and

decoding circuitry configured and/or programmed to decode a code block of the transport block,

wherein in a case that the decoding circuitry fails to decode the code block, the decoding circuitry stores at least soft channel bits corresponding to a range of prescribed soft channel bits,

the prescribed soft channel bits are based on a soft buffer size for the code block, and

the soft buffer size for the code block is based at least on the first information used for determining the first maximum number of the layers.

2. The terminal device according to claim 1,

wherein the transmission circuitry transmits the RI on a Physical Uplink Shared CHannel (PUSCH).

3. The terminal device according to claim 1,

wherein the terminal device is configured with first transmission mode for the PDSCH transmission.

4. The terminal device according to claim 1,

wherein the transmission circuitry transmits capability information including second information and third information,

the second information indicates second maximum number of the layers supported by the terminal device in a downlink and first UE category corresponding to first total number of soft channel bits capable of being utilized for Hybrid Automatic

Repeat reQuest (HARQ) processing in the downlink,

the third information indicates a third maximum number of the layers supported by the terminal device in the downlink, and second UE category corresponding to second total number of soft channel bits capable of being utilized for Hybrid Automatic Repeat reQuest (HARQ) processing in the downlink, and

the soft buffer size for the code block is given by referring to any one of the first total number and the second total number, based on whether the first information used for determining the first maximum number of the layers is configured to a value indicating a fourth maximum number of the layers.

5. The terminal device according to claim 4,

wherein in a case that the first information used for determining the first maximum number of the layers is configured to the value indicating the fourth maximum number of the layers, the soft buffer size for the code block is given by referring to the first total number, and

in a case that the first information used for determining the first maximum number of the layers is not configured to the value indicating the fourth maximum number of the layers, the soft buffer size for the code block is given by referring to the second total number.

6. The terminal device according to claim 4,

wherein in a case that the first information is received, the first maximum number of the layers is given by referring to the first information.

7. The terminal device according to claim 4,

wherein in a case that the first information is not received, the first maximum number of the layers is given by referring to the third information.

8. A communication method used for a terminal device, the method comprising the steps of:

transmitting a Rank Indicator (RI) for Physical Downlink Shared CHannel (PDSCH) transmission;

receiving first information used for determining first maximum number of layers

being the first maximum number assumed for determining a bit width for the RI;

receiving a transport block on the PDSCH;

decoding a code block of the transport block; and

storing, in a case of failing to decode the code block, at least soft channel bits corresponding to a range of prescribed soft channel bits;

wherein the prescribed soft channel bits are based on a soft buffer size for the code block, and

the soft buffer size for the code block is based at least on first information used for determining the first maximum number of the layers.

9. The communication method according to claim 8,

wherein the RI is transmitted on a Physical Uplink Shared CHannel (PUSCH).

10. The communication method according to claim 8,

wherein the terminal device is configured with first transmission mode for the PDSCH transmission.

11. The communication method according to claim 8, comprising the step of:

transmitting capability information including second information and third information,

wherein the second information indicates second maximum number of the layers supported by the terminal device in a downlink and first UE category corresponding to first total number of soft channel bits capable of being utilized for Hybrid Automatic Repeat reQuest (HARQ) processing in the downlink,

the third information indicates a third maximum number of the layers supported by the terminal device in the downlink, and second UE category corresponding to second total number of soft channel bits capable of being utilized for Hybrid Automatic Repeat reQuest (HARQ) processing in the downlink, and

the soft buffer size for the code block is given by referring to any one of the first total number and the second total number, based on whether the first information used for determining the first maximum number of the layers is configured to a value indicating a fourth maximum number of the layers.

12. The communication method according to claim 11,

wherein in a case that the first information used for determining the first maximum number of the layers is configured to the value indicating the fourth maximum number of the layers, the soft buffer size for the code block is given by referring to the first total number, and

in a case that the first information used for determining the first maximum number of the layers is not configured to the value indicating the fourth maximum number of the layers, the soft buffer size for the code block is given by referring to the second total number.

13. The communication method according to claim 11,

wherein in a case that the first information is received, the first maximum number of the layers is given by referring to the first information.

14. The communication method according to claim 11,

wherein in a case that the first information is not received, the first maximum number of the layers is given by referring to the third information.

15. An integrated circuit causing a terminal device to exhibit a series of functions including the functions of:

transmitting a Rank Indicator (RI) for Physical Downlink Shared CHannel (PDSCH) transmission;

receiving first information used for determining first maximum number of layers being the first maximum number assumed for determining a bit width for the RI;

receiving a transport block on the PDSCH;

decoding a code block of the transport block; and

storing, in a case of failing to decode the code block, at least soft channel bits corresponding to a range of prescribed soft channel bits,

wherein the prescribed soft channel bits are based on a soft buffer size for the code block, and

the soft buffer size for the code block is based at least on first information used for determining the first maximum number of the layers.

16. The integrated circuit according to claim 15,

wherein the RI is transmitted on a Physical Uplink Shared CHannel (PUSCH).

17. The integrated circuit according to claim 15,

wherein the terminal device is configured with first transmission mode for the PDSCH transmission.

18. The integrated circuit according to claim 15, causing the terminal device to exhibit a function of transmitting capability information including second information and third information,

wherein the second information indicates second maximum number of the layers supported by the terminal device in a downlink and first UE category corresponding to first total number of soft channel bits capable of being utilized for Hybrid Automatic Repeat reQuest (HARQ) processing in the downlink,

the third information indicates a third maximum number of the layers supported by the terminal device in the downlink, and second UE category corresponding to second total number of soft channel bits capable of being utilized for Hybrid Automatic Repeat reQuest (HARQ) processing in the downlink, and

the soft buffer size for the code block is given by referring to any one of the first total number and the second total number, based on whether the first information used for determining the first maximum number of the layers is configured to a value indicating a fourth maximum number of the layers.

19. The integrated circuit according to claim 18,

wherein in a case that the first information used for determining the first maximum number of the layers is configured to the value indicating the fourth maximum number of the layers, the soft buffer size for the code block is given by referring to the first total number, and

in a case that the first information used for determining the first maximum number of the layers is not configured to a value indicating the fourth maximum number of the layers, the soft buffer size for the code block is given by referring to the second total number.

20. The integrated circuit according to claim 18,

wherein in a case that the first information is received, the first maximum number of the layers is given by referring to the first information.