CLAIMS

[Claim 1]

A base station device communicating with a mobile station device,

wherein the base station device notifies, to the mobile station device by RRC signaling, a cell ID of another base station device different from the aforesaid base station device, number of antenna ports for a cell-specific reference signal in the aforesaid other base station device, and subframe information indicating MBSFN subframes that are reserved for MBSFN, which is used as an MBSFN by the aforesaid other base station device.

[Claim 2]

The base station device according to Claim 1, wherein the MBSFN subframes include an OFDM symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

[Claim 3]

The base station device according to Claim 1, wherein the subframe information contains a bitmap indicating MBSFN subframe allocation in a predetermined number of subframes.

[Claim 4]

A mobile station device communicating with a base station device,

wherein the mobile station device receives, from the base station device by RRC signaling, a cell ID of another base station device different from the aforesaid base station device, number of antenna ports for a cell-specific reference signal in the aforesaid other base station device, and subframe information indicating MBSFN subframes that are reserved for MBSFN, which is used as an MBSFN by the aforesaid other base station device.

[Claim 5]

The mobile station device according to Claim 4, wherein the mobile station device employs the received information to mitigate interference suffered from the cell-specific reference signal that is transmitted from the aforesaid other base station device.

[Claim 6]

The mobile station device according to Claim 4, wherein the MBSFN subframes includes an OFDM symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

[Claim 7]

The mobile station device according to Claim 4, wherein the subframe information contains a bitmap indicating MBSFN subframe allocation in a predetermined number of subframes.

[Claim 8]

A transmission method in a base station device communicating with a mobile station device, the transmission method comprising the step of:

notifying, to the mobile station device by RRC signaling, a cell ID of another base station device different from the aforesaid base station device, number of antenna ports for a cell-specific reference signal in the aforesaid other base station device, and subframe information indicating MBSFN subframes that are reserved for MBSFN, which is used as an MBSFN by the aforesaid other base station device.

[Claim 9]

The transmission method according to Claim 8, wherein the MBSFN subframes include an OFDM symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

[Claim 10]

The transmission method according to Claim 8, wherein the subframe information contains a bitmap indicating MBSFN subframes allocation in a predetermined number of subframes.

[Claim 11]

A reception method in a mobile station device communicating with a base station device, the reception method comprising the step of:

receiving, from the base station device by RRC signaling, a cell ID of another base station device different from the aforesaid base station device, number of antenna ports for a cell-specific reference signal in the aforesaid other base station device, and subframe information indicating MBSFN subframes that are reserved for MBSFN, which is used as an MBSFN by the aforesaid other base station device.

[Claim 12]

The reception method according to Claim 11, wherein the received information is employed to mitigate interference suffered from the cell-specific reference signal that is transmitted from the aforesaid other base station device.

[Claim 13]

The reception method according to Claim 11, wherein the MBSFN subframes include an OFDM symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

[Claim 14]

The reception method according to Claim 11, wherein the subframe information contains a bitmap indicating MBSFN subframe allocation in a predetermined number of subframes.

[Claim 15]

An integrated circuit incorporated in a base station

device communicating with a mobile station device,

wherein the integrated circuit notifies, to the mobile station device by RRC signaling, a cell ID of another base station device different from the aforesaid base station device, number of antenna ports for a cell-specific reference signal in the aforesaid other base station device, and subframe information indicating MBSFN subframes that are reserved for MBSFN, which is used as an MBSFN by the aforesaid other base station device.

[Claim 16]

The integral circuit according to Claim 15, wherein the MBSFN subframes include an OFDM symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

[Claim 17]

The integral circuit according to Claim 15, wherein the subframe information contains a bitmap indicating MBSFN subframe allocation in a predetermined number of subframes.

[Claim 18]

An integrated circuit incorporated in a mobile station device communicating with a base station device,

wherein the integrated circuit receives, from the base station device by RRC signaling, a cell ID of another base station device different from the aforesaid base station

device, number of antenna ports for a cell-specific reference signal in the aforesaid other base station device, and subframe information indicating MBSFN subframes that are reserved for MBSFN, which is used as an MBSFN by the aforesaid other base station device.

[Claim 19]

The integral circuit according to Claim 18, wherein the received information is employed to mitigate interference suffered from the cell-specific reference signal that is transmitted from the aforesaid other base station device.

[Claim 20]

The integral circuit according to Claim 18, wherein the MBSFN subframes include an OFDM symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

[Claim 21]

The integral circuit according to Claim 18, wherein the subframe information contains a bitmap indicating MBSFN subframe allocation in a predetermined number of subframes.

Claims

1. A base station device communicating with a mobile station device in a first cell, wherein

the base station device notifies, to the mobile station device, information on a cell-specific reference signal of another cell concerning a frequency of the first cell by Radio Resource Control signaling, and

the information on the cell-specific reference signal of the another cell includes a cell ID, the number of antenna ports for the cell-specific reference signal, and configuration information of Multimedia Broadcast multicast service Single Frequency Network (MBSFN) subframes.

2. The base station device according to claim 1, wherein the another cell is a neighbor cell.

3. The base station device according to any of claims 1 or 2, wherein each of the MBSFN subframes includes an Orthogonal Frequency Division Multiplexing (OFDM) symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

4. The base station device according to any of claims 1 to 3, wherein the configuration information of the MBSFN subframes contains a bitmap indicating MBSFN subframe allocation in a predetermined number of subframes.

5. The base station device according to any of claims 1 to 4, wherein the information on the cell-specific reference signal of the another cell is information to mitigate interference.

6. A mobile station device communicating with a base station device in a first cell, wherein

the mobile station device receives information on a cell-specific reference signal of another cell concerning a frequency of the first cell, which are notified from the base station device by Radio Resource Control signaling,

the information on the cell-specific reference signal of the another cell includes a cell ID, the number of antenna ports for the cell-specific reference signal, and configuration information of Multimedia Broadcast multicast service Single Frequency

Network (MBSFN) subframes, and

the mobile station device recognizes the cell-specific reference signal of the another cell based on the information on the cell-specific reference signal of the another cell.

7. The mobile station device according to claim 6, wherein the another cell is a neighbor cell.

8. The mobile station device according to any of claims 6 or 7, wherein each of the MBSFN subframes includes an Orthogonal Frequency Division Multiplexing (OFDM) symbol area in which the cell-specific reference signal is mapped, and an OFDM symbol area in which the cell-specific reference signal is not mapped.

9. The mobile station device according to any of claims 6 to 8, wherein the configuration information of the MBSFN subframes contains a bitmap indicating MBSFN subframe allocation in a predetermined number of subframes.

10. The mobile station device according to any of claims 6 to 9, wherein the information on the cell-specific reference signal of the another cell is information to mitigate interference.

11. A communication method of a base station device communicating with a mobile station device in a first cell, the communication method comprising the step of:

notifying, to the mobile station device, information on a cell-specific reference signal of another cell concerning a frequency of the first cell by Radio Resource Control signaling, wherein

the information on the cell-specific reference signal of the another cell includes a cell ID, the number of antenna ports for the cell-specific reference signal, and configuration information of for Multimedia Broadcast multicast service Single Frequency Network (MBSFN) subframes.

12. A communication method of a base station device communicating with a mobile station device in a cell, the communication method comprising the steps of:

transmitting a synchronization signal based on a primary cell ID for the cell;

transmitting a primary cell-specific reference signal based on the primary cell ID, based on configuration information of primary Multimedia Broadcast multicast

service Single Frequency Network (MBSFN) subframes in the cell; and

notifying, to the mobile station device, information concerning a frequency of the cell by Radio Resource Control signaling, wherein

the information concerning the frequency of the cell includes a secondary cell ID, the number of antenna ports for a secondary cell-specific reference signal, and configuration information of secondary MBSFN subframes.

13. A communication method of a mobile station device communicating with a base station device in a first cell, the communication method comprising the steps of:

receiving information on a cell-specific reference signal of another cell concerning a frequency of the first cell, which are notified from the base station device by Radio Resource Control signaling, wherein

the information on the cell-specific reference signal of the another cell includes a cell ID, the number of antenna ports for the cell-specific reference signal, and configuration information of Multimedia Broadcast multicast service Single Frequency Network (MBSFN) subframes; and

recognizing the cell-specific reference signal of the another cell based on the information on the cell-specific reference signal of the another cell.

14. A communication method of a mobile station device communicating with a base station device in a cell, the communication method comprising the step of:

receiving a synchronization signal based on a primary cell ID for the cell;

receiving a primary cell-specific reference signal based on the primary cell ID, based on configuration information of primary Multimedia Broadcast multicast service Single Frequency Network (MBSFN) subframes in the cell;

receiving, from the base station device, information concerning a frequency of the cell by Radio Resource Control signaling, wherein the information concerning the frequency of the cell includes a secondary cell ID, the number of antenna ports for a secondary cell-specific reference signal, and configuration information of secondary MBSFN subframes; and

recognizing the secondary cell-specific reference signal based on the secondary cell ID, the number of antenna ports for a secondary cell-specific reference signal, and the configuration information of secondary MBSFN subframes.

15. An integrated circuit incorporated in a base station device communicating with a mobile station device in a first cell, wherein

the integrated circuit notifies, to the mobile station device, information on a cell-specific reference signal of another cell concerning a frequency of the first cell by Radio Resource Control signaling, and

the information on the cell-specific reference signal of the another cell includes a cell ID, the number of antenna ports for the cell-specific reference signal, and configuration information of Multimedia Broadcast multicast service Single Frequency Network (MBSFN) subframes.

16. An integrated circuit incorporated in a mobile station device communicating with a base station device in a first cell, wherein

the integrated circuit receives information on a cell-specific reference signal of the another cell concerning a frequency of the first cell, which are notified from the base station device by Radio Resource Control signaling,

the information on the cell-specific reference signal of the another cell includes a cell ID, the number of antenna ports for the cell-specific reference signal, and configuration information of Multimedia Broadcast multicast service Single Frequency Network (MBSFN) subframes, and

the integrated circuit recognizes the cell-specific reference signal of the another cell based on the information on the cell-specific reference signal of the another cell.