NPL 3

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Summary

[0004] However, there is room for study on a method for improving reception performance of an uplink signal.

[0005] A non-limiting example of the present disclosure facilitates providing a terminal, a base station, and a communication method each capable of improving reception performance of an uplink signal.

[0006] A terminal according to an example of the present disclosure includes: reception circuitry, which in operation, receives control information corresponding to a downlink message in a random access procedure; control circuitry, which in operation, determines a configuration of repetitive transmission of an uplink control signal for the downlink message based on a value of a field in the control information, the field being related to a configuration different from the configuration of repetitive transmission.

[0006A] In one aspect, the present disclosure refers to a terminal comprising a receiver, which in operation, receives control information indicating a number of repetitions for an uplink control signal, in a random access procedure, circuitry, which in operation, determines the number of repetitions of the uplink control signal based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[0006B] In another aspect, the present disclosure refers to a communication method comprising receiving control information indicating a number of repetitions for an uplink control signal, in a random access procedure, determining the number of repetitions of the uplink control signal based on the control information, the control information being

transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[0006C] In yet another aspect, the present disclosure refers to a base station comprising, a transmitter, which in operation, transmits control information indicating a number of repetitions for an uplink control signal, in a random access procedure, a receiver, which in operation, receives repetitions of the uplink control signal determined based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[0006D] In yet another aspect, the present disclosure refers to a communication method comprising, transmitting control information indicating a number of repetitions for an uplink control signal, in a random access procedure, receiving repetitions of the uplink control signal determined based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[0006E] In yet another aspect, the present disclosure refers to an integrated circuit comprising, reception circuitry, which in operation, controls a reception of control information indicating a number of repetitions for an uplink control signal, in a random access procedure, determination circuitry, which in operation, controls of a determination of the number of repetitions of the uplink control signal based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[0006F] In yet another aspect, the present disclosure refers to an integrated circuit comprising, transmission circuitry, which in operation, controls of a transmission of control information indicating a number of repetitions for an uplink control signal, in a random access procedure, reception circuitry, which in operation, controls of a reception of

repetitions of the uplink control signal determined based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[0007] It should be noted that general or specific examples may be implemented as a system, an apparatus, a method, an integrated circuit, a computer program, a storage medium, or any selective combination thereof.

[0008] According to an example of the present disclosure, it is possible to improve reception performance of an uplink signal.

[0009] Additional benefits and advantages of the disclosed examples will become apparent from the specification and drawings. The benefits and/or advantages may be individually obtained by the various examples 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.

CLAIMS

[Claim 1] A terminal, comprising:

a receiver, which in operation, receives control information indicating a number of repetitions for an uplink control signal, in a random access procedure;

circuitry, which in operation, determines the number of repetitions of the uplink control signal based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[Claim 2] The terminal according to claim 1, wherein

the control information is indicated in a field related to a downlink assignment index.

[Claim 3] The terminal according to claim 2, wherein

the field related to the downlink assignment index is reserved bits in some conditions.

[Claim 4] The terminal according to claim 1, wherein

the control information is scrambled with Temporary Cell - Radio Network Temporary Identifier (TC-RNTI).

[Claim 5] The terminal according to claim 1, wherein

the circuitry determines a number of repetitions of another uplink transmission based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant.

[Claim 6] The terminal according to claim 2, wherein

the circuitry determines a number of repetitions of another uplink transmission based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant, and

the field related to a downlink assignment index is different from the field related to the MCS of RAR UL grant.

[Claim 7] A communication method, comprising:

receiving control information indicating a number of repetitions for an uplink control signal, in a random access procedure;

determining the number of repetitions of the uplink control signal based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[Claim 8] The communication method according to claim 7, wherein

the control information is indicated in a field related to a downlink assignment index.

[Claim 9] The communication method according to claim 8, wherein

the field related to the downlink assignment index is reserved bits in some conditions.

[Claim 10] The communication method according to claim 7, wherein

the control information is scrambled with Temporary Cell - Radio Network

Temporary Identifier (TC-RNTI).

[Claim 11] The communication method according to claim 7, wherein

determining a number of repetitions of another uplink transmission based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant.

[Claim 12] The communication method according to claim 8, wherein

determining a number of repetitions of another uplink transmission based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant, and

the field related to a downlink assignment index is different from the field related to the MCS of RAR UL grant.

[Claim 13] A base station, comprising:

a transmitter, which in operation, transmits control information indicating a number of repetitions for an uplink control signal, in a random access procedure;

a receiver, which in operation, receives repetitions of the uplink control signal determined based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[Claim 14] The base station according to claim 13, wherein

the control information is indicated in a field related to a downlink assignment index.

[Claim 15] The base station according to claim 14, wherein

the field related to the downlink assignment index is reserved bits in some conditions.

[Claim 16] The base station according to claim 13, wherein

the control information is scrambled with Temporary Cell - Radio Network Temporary Identifier (TC-RNTI).

[Claim 17] The base station according to claim 13, wherein

the receiver receives repetitions of another uplink transmission determined based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant.

[Claim 18] The base station according to claim 14, wherein

the receiver receives repetitions of another uplink transmission determined based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant, and

the field related to a downlink assignment index is different from the field related to the MCS of RAR UL grant.

[Claim 19] A communication method, comprising:

transmitting control information indicating a number of repetitions for an uplink control signal, in a random access procedure;

receiving repetitions of the uplink control signal determined based on the control information, the control information being transmitted in downlink control information

(DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[Claim 20] The communication method according to claim 19, wherein the control information is indicated in a field related to a downlink assignment index.

[Claim 21] The communication method according to claim 20, wherein the field related to the downlink assignment index is reserved bits in some conditions.

[Claim 22] The communication method according to claim 19, wherein the control information is scrambled with Temporary Cell - Radio Network Temporary Identifier (TC-RNTI).

[Claim 23] The communication method according to claim 19, wherein receiving repetitions of another uplink transmission determined based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant.

[Claim 24] The communication method according to claim 20, wherein receiving repetitions of another uplink transmission determined based on another control information, the another control information being indicated in a field related to a modulation and coding scheme (MCS) of RAR UL grant, and the field related to a downlink assignment index is different from the field related to

the MCS of RAR UL grant.

[Claim 25] An integrated circuit, comprising:

reception circuitry, which in operation, controls a reception of control information indicating a number of repetitions for an uplink control signal, in a random access procedure;

determination circuitry, which in operation, controls of a determination of the number of repetitions of the uplink control signal based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.

[Claim 26] An integrated circuit, comprising:

transmission circuitry, which in operation, controls of a transmission of control information indicating a number of repetitions for an uplink control signal, in a random access procedure;

reception circuitry, which in operation, controls of a reception of repetitions of the uplink control signal determined based on the control information, the control information being transmitted in downlink control information (DCI) scheduling a physical downlink shared channel (PDSCH) that includes UE contention resolution identity.