

Claims

1. A method of transmitting a random access channel (RACH) preamble by a user equipment in a wireless communication system, the method comprising:
generating the RACH preamble; and
transmitting the RACH preamble using a RACH resource,
wherein the RACH resource is comprised of a plurality of orthogonal frequency division multiplexing (OFDM) symbols in a time domain,
wherein a length N_{RA} of the RACH preamble is equal to a total length of the plurality of OFDM symbols,
wherein the RACH preamble consists of a cyclic prefix (CP) part and a sequence part,
wherein the sequence part includes n preambles, each preamble having a length N_u ,
and a length N_{SEQ} of the sequence part is $N_u * n$, where n is a positive integer, and
wherein a length $N_{CP,RA}$ of the CP part satisfies $N_{CP,RA} + N_{SEQ} = N_{RA}$.
2. The method according to claim 1,
wherein the RACH preamble spans the OFDM symbols from start to end of the plurality of OFDM symbols in the time domain.
3. The method according to claim 1,
wherein N_u is a fixed value.
4. The method according to claim 1, further comprising:
receiving information on a random access preamble format,
wherein the RACH preamble is generated in accordance with the random access preamble format.
5. The method according to claim 1,
wherein the wireless communication system is a system to which reception beamforming by a base station is applicable per OFDM symbol.

6. A method of receiving a random access channel (RACH) preamble by a base station in a wireless communication system, the method comprising:
 - transmitting RACH preamble configuration information; and
 - receiving the RACH preamble using a RACH resource based on the RACH preamble configuration information,
 - wherein the RACH resource is comprised of a plurality of orthogonal frequency division multiplexing (OFDM) symbols in a time domain,
 - wherein a length N_{RA} of the RACH preamble is equal to a total length of the plurality of OFDM symbols, and
 - wherein the RACH preamble consists of a cyclic prefix (CP) part and a sequence part,
 - wherein the sequence part includes n preambles, each preamble having a length N_u , and a length N_{SEQ} of the sequence part is $N_u * n$, where n is a positive integer, and
 - wherein a length $N_{CP,RA}$ of the CP part satisfies $N_{CP,RA} + N_{SEQ} = N_{RA}$.
7. The method according to claim 6,
 - wherein the RACH preamble spans the OFDM symbols from start to end of the plurality of OFDM symbols in the time domain.
8. The method according to claim 6,
 - wherein N_u is a fixed value.
9. The method according to claim 6,
 - wherein the RACH preamble configuration information includes a random access preamble format, and
 - wherein the RACH preamble is received in accordance with the random access preamble format.
10. The method according to claim 6,
 - wherein the wireless communication system is a system to which reception beamforming by the base station is applicable per OFDM symbol.

11. A user equipment for transmitting a random access channel (RACH) preamble in a wireless communication system, the user equipment comprising,
a radio frequency (RF) unit, and
a processor configured to control the RF unit,
wherein the processor is configured to:
generate the RACH preamble; and
control the RF unit to transmit the RACH preamble using a RACH resource,
wherein the RACH resource is comprised of a plurality of orthogonal frequency division multiplexing (OFDM) symbols in a time domain,
wherein a length N_{RA} of the RACH preamble is equal to a total length of the plurality of OFDM symbols, and
wherein the RACH preamble consists of a cyclic prefix (CP) part and a sequence part,
wherein the sequence part includes n preambles, each preamble having a length N_u ,
and a length N_{SEQ} of the sequence part is $N_u * n$, where n is a positive integer, and
wherein a length $N_{CP,RA}$ of the CP part satisfies $N_{CP,RA} + N_{SEQ} = N_{RA}$.

12. The user equipment according to claim 11,
wherein the RACH preamble spans the OFDM symbols from start to end of the plurality of OFDM symbols in the time domain.

13. The user equipment according to claim 11,
wherein N_u is a fixed value.

14. The user equipment according to claim 11,
wherein the processor is configured to control the RF unit to receive information on a random access preamble format, and
wherein the processor is configured to generate the RACH preamble in accordance with the random access preamble format.

15. The user equipment according to claim 11,
wherein the wireless communication system is a system to which reception

beamforming by a base station is applicable per OFDM symbol.

16. A base station for receiving a random access channel (RACH) preamble in a wireless communication system, the base station comprising,
a radio frequency (RF) unit, and
a processor configured to control the RF unit,
wherein the processor is configured to:
control the RF unit to transmit RACH preamble configuration information; and
control the RF unit to receive the RACH preamble using a RACH resource based on the RACH preamble configuration information,
wherein the RACH resource is comprised of a plurality of orthogonal frequency division multiplexing (OFDM) symbols in a time domain,
wherein a length N_{RA} of the RACH preamble is equal to a total length of the plurality of OFDM symbols, and
wherein the RACH preamble consists of a cyclic prefix (CP) part and a sequence part,
wherein the sequence part includes n preambles, each preamble having a length N_u , and a length N_{SEQ} of the sequence part is $N_u * n$, where n is a positive integer, and
wherein a length $N_{CP,RA}$ of the CP part satisfies $N_{CP,RA} + N_{SEQ} = N_{RA}$.

17. The base station according to claim 16,
wherein the RACH preamble spans the OFDM symbols from start to end of the plurality of OFDM symbols in the time domain.

18. The base station according to claim 16,
wherein N_u is a fixed value.

19. The base station according to claim 16,
wherein the RACH preamble configuration information includes a random access preamble format, and
wherein the processor controls the RF unit to receive the RACH preamble in accordance with the random access preamble format and.

20. The base station according to claim 16,
wherein the wireless communication system is a system to which reception beamforming by the base station is applicable per OFDM symbol.