CLAIMS

1. A 2-step random access method for an unlicensed band, wherein the method is performed by a terminal device, and the method comprises:

determining, based on a listen-before-talk (LBT) detection result, whether to send an msgA and whether to update a power ramping counter for the msgA, wherein the power ramping counter is used to determine transmission power for the msgA, and the msgA comprises a physical random access channel (PRACH) and a physical uplink shared channel (PUSCH); and

determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA;

wherein the power ramping counter for the msgA comprises the power ramping counter shared by the PRACH and the PUSCH, and the determining, based on an LBT detection result, whether to update a power ramping counter for the msgA comprises:

if at least one of the PRACH and the PUSCH passes LBT detection, performing an operation of adding 1 on the power ramping counter.

2. The method according to claim 1, wherein the transmission counter for the msgA comprises the transmission counter shared by the PRACH and the PUSCH.

3. The method according to claim 2, wherein the determining, based on an LBT detection result, whether to send an msgA and the determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA comprise:

if the PUSCH passes LBT detection, sending the PUSCH and initiating an msgB receiving window; and

if the msgB receiving window expires and/or contention resolution fails, performing an operation of adding 1 on the transmission counter.

4. The method according to claim 1, wherein the transmission counter for the msgA comprises a transmission counter for the PRACH and a transmission counter for the PUSCH, the PRACH and the PUSCH use different transmission

counters, and the determining, based on an LBT detection result, whether to send an msgA and whether to update a power ramping counter for the msgA and the determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA comprise:

if the PRACH fails LBT detection,

skipping sending the PRACH and the PUSCH; and

suspending the power ramping counter, suspending the transmission counter for the PRACH, and suspending an operation of adding 1 on the transmission counter for the PUSCH.

5. The method according to claim 1, wherein the transmission counter for the msgA comprises the transmission counter for the PRACH and the transmission counter for the PUSCH, the PRACH and the PUSCH use different transmission counters, and the method further comprises:

if the PRACH fails LBT detection,

determining, based on the number of LBT detection failures of the PRACH and/or the PUSCH, whether to terminate a current random access procedure; and

if it is determined that the current random access procedure is to be terminated, performing LBT failure recovery.

6. The method according to claim 1, wherein the transmission counter for the msgA comprises the transmission counter for the PRACH and the transmission counter for the PUSCH, the PRACH and the PUSCH use different transmission counters, and the determining, based on an LBT detection result, whether to send an msgA and whether to update a power ramping counter for the msgA comprises:

if the PRACH passes LBT detection and the PUSCH fails LBT detection,

sending the PRACH and skipping sending the PUSCH; and

performing an operation of adding 1 on the power ramping counter.

7. The method according to claim 6, wherein after the sending the PRACH, the method further comprises:

initiating an msgB or msg2 receiving window; and

if the PUSCH comprises a cell-radio network temporary identifier (C-RNTI) media access control control element (MAC CE),

during operation of the msgB or msg2 receiving window, monitoring a physical downlink control channel (PDCCH) scrambled by a random access-radio network transmission identifier (RA-RNTI), and skipping monitoring a PDCCH scrambled by the C-RNTI.

8. The method according to claim 7, wherein after the sending the PRACH, the method further comprises:

falling back to a 4-step random access procedure, to send the PUSCH.

9. The method according to claim 8, wherein the determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA comprises:

if the msgB or msg2 receiving window expires and/or contention resolution fails,

performing an operation of adding 1 on the transmission counter for the PRACH, and performing an operation of adding 1 on the transmission counter for the PUSCH.

10. The method according to claim 8, wherein the method further comprises:

if at least one of the following is met, sending indication information to a higher layer, wherein the indication information is used to indicate a random access problem:

a count on the transmission counter for the PRACH reaches a first threshold;

a count on the transmission counter for the PUSCH reaches a second threshold; or

a larger one of a count on the transmission counter for the PRACH and a count on the transmission counter for the PUSCH reaches a third threshold.

11. A terminal device, comprising a memory, a processor, and a computer program stored in the memory and capable of running on the processor, wherein the computer program, when being executed by the processor, causes the terminal device to perform:

determining, based on a listen-before-talk (LBT) detection result, whether to send an msgA and whether to update a power ramping counter for the msgA, wherein the power ramping counter is used to determine transmission power for the msgA, and the msgA comprises a physical random access channel (PRACH) and a physical uplink shared channel (PUSCH); and

determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA;

wherein the power ramping counter for the msgA comprises the power ramping counter shared by the PRACH and the PUSCH; when determining, based on an LBT detection result, whether to update a power ramping counter for the msgA, the computer program is executed by the processor, causes the terminal device to perform,

if at least one of the PRACH and the PUSCH passes LBT detection, performing an operation of adding 1 on the power ramping counter.

12. The terminal device according to claim 11, wherein the transmission counter for the msgA comprises the transmission counter shared by the PRACH and the PUSCH.

13. The terminal device according to claim 12, wherein the determining, based on an LBT detection result, whether to send an msgA and the determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA comprise:

if the PUSCH passes LBT detection, sending the PUSCH and initiating an msgB receiving window; and

if the msgB receiving window expires and/or contention resolution fails, performing an operation of adding 1 on the transmission counter.

14. The terminal device according to claim 11, wherein the transmission counter for the msgA comprises a transmission counter for the PRACH and a transmission counter for the PUSCH, the PRACH and the PUSCH use different transmission counters, and the determining, based on an LBT detection result, whether to send an msgA and whether to update a power ramping counter for the msgA and the determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA comprise:

if the PRACH fails LBT detection,

skipping sending the PRACH and the PUSCH; and

suspending the power ramping counter, suspending the transmission counter for the PRACH, and suspending an operation of adding 1 on the transmission counter for the PUSCH.

15. The terminal device according to claim 11, wherein the transmission counter for the msgA comprises the transmission counter for the PRACH and the transmission counter for the PUSCH, the PRACH and the PUSCH use different transmission counters, and the program, when being executed by the processor, further causes the terminal device to perform:

if the PRACH fails LBT detection,

determining, based on the number of LBT detection failures of the PRACH and/or the PUSCH, whether to terminate a current random access procedure; and

if it is determined that the current random access procedure is to be terminated, performing LBT failure recovery.

16. The terminal device according to claim 11, wherein the transmission counter for the msgA comprises the transmission counter for the PRACH and the transmission counter for the PUSCH, the PRACH and the PUSCH use different transmission counters, and the determining, based on an LBT detection result,

whether to send an msgA and whether to update a power ramping counter for the msgA comprises:

if the PRACH passes LBT detection and the PUSCH fails LBT detection,

sending the PRACH and skipping sending the PUSCH; and

performing an operation of adding 1 on the power ramping counter.

17. The terminal device according to claim 16, wherein after the sending the PRACH, the terminal device is further caused to perform:

initiating an msgB or msg2 receiving window; and

if the PUSCH comprises a cell-radio network temporary identifier (C-RNTI) media access control control element (MAC CE),

during operation of the msgB or msg2 receiving window, monitoring a physical downlink control channel (PDCCH) scrambled by a random access-radio network transmission identifier (RA-RNTI), and skipping monitoring a PDCCH scrambled by the C-RNTI.

18. The terminal device according to claim 17, wherein after the sending the PRACH, the terminal device is further caused to perform:

falling back to a 4-step random access procedure, to send the PUSCH.

19. The terminal device according to claim 18, wherein the determining, based on a sending status of the msgA, whether to update a transmission counter for the msgA comprises:

if the msgB or msg2 receiving window expires and/or contention resolution fails,

performing an operation of adding 1 on the transmission counter for the PRACH, and performing an operation of adding 1 on the transmission counter for the PUSCH.

20. A computer-readable storage medium, wherein the computer-readable storage medium stores a computer program, and when the computer program is

executed by a processor, the steps of the 2-step random access method for an unlicensed band according to any one of claims 1 to 10 are implemented.