

[0036] In action 108, the UE (e.g., the MAC entity of the UE) may reset the LBT failure counter after the MAC entity has not received the LBT failure indication for a time period. In one implementation, the UE may set the LBT failure counter to an initial value (e.g., 0) when the UE resets the LBT failure counter. In one implementation, the time period may be indicated by a configurable timer (e.g., *lbt-FailureDetectionTimer*) configured by a configuration (e.g., an RRC configuration). In one implementation, the time period may be broadcast in system information.

[0037] An LBT failure may be caused by different operations or different UL transmission types (e.g., transmission of RA preamble, msgA, msg3, SR, or UL data on configured grants). In one implementation, there may be one common LBT failure counter for all UL transmission types.

In one implementation, when there are consecutive *kI* LBT failure indications (or consistent *kI* LBT failure indications) received from a lower layer (e.g., a PHY layer) regardless of the UL transmission types, a MAC entity may determine an LBT failure event occurs. *kI* may be the maximum number of consecutive LBT failure indications (or consistent LBT failure indications). For example, *kI* may be a positive integer indicating the threshold in action 106. The LBT failure event may also be referred to as a “consistent LBT failure” since the MAC entity consistently receives the LBT failure indication.

[0038] In one implementation, there may be multiple LBT failure counters corresponding to different UL transmission operations, and thus there may be different values of *kI* for different UL transmission operations. In one implementation, the value of *kI* for each operation may be provided in a common signaling (e.g., an LBT configuration that provides LBT related information or parameters). In one implementation, the value of *kI* for different operations may be provided separately in different signaling. For example, the value of *kI* for an RA procedure may be provided in a random access related signaling (e.g., dedicated/common RACH configuration), the value of *kI* for SR may be provided in an SR related signaling, and the value of *kI* for configured grants may be provided in a related Configured Grant Configuration.

[0039] In one implementation, after determining that the LBT failure event occurs, the MAC entity may indicate an LBT failure problem to an upper layer (e.g., an RRC layer). In one implementation, the MAC entity may indicate the LBT failure problem and the operation that causes the LBT failure problem to the upper layer. For example, an LBT failure cause may be used to indicate to the upper layer what kind of failure problem happens to the MAC entity. In one implementation, the LBT failure cause may have one or more bits (e.g., 2 bits), where different

values may represent the different operations causing the failure. It may depend on UE's implementation whether to indicate different LBT failure causes from the MAC layer to the RRC layer. In one implementation, the RRC layer may receive an LBT failure problem related to the SR operation from the MAC layer, and the RRC layer may receive another LBT failure problem related to the RA operation from the MAC layer, and so on.

[0040] In one implementation, the UE may use a UE variable (e.g., the LBT failure counter in action 104), to count the number of consecutive LBT failure indications regardless of the UL transmission types. In one implementation, the UE (e.g., the MAC entity of the UE) may set the LBT failure counter to 0 in the initial state. In one implementation, the UE (e.g., the MAC entity of the UE) may increase the LBT failure counter by 1 when receiving an LBT failure indication for all UL transmissions. For example, the UE (e.g., the MAC entity of the UE) may first increase the LBT failure counter by 1 when receiving an LBT failure indication that is caused by an unsuccessful preamble transmission due to LBT failure. Then, the UE (e.g., the MAC entity of the UE) may again increase the LBT failure counter by 1 when receiving another LBT failure indication that is caused by an unsuccessful UL transmission using configured grants due to LBT failure, and so on.

[0041] In one implementation, the threshold (e.g., the value of kI) may be a fixed value or configured by the network (e.g., via dedicated signaling or via broadcasting in system information). In one implementation, if the threshold is not configured by the network, the UE may apply a default value for the threshold. In one implementation, the UE may first apply the threshold broadcast in system information and then apply a new value of the threshold if configured via dedicated signaling (e.g., RRC signaling).

[0042] In one implementation, the MAC entity may consider LBT for a UL transmission attempt as successful after the MAC entity has not received an LBT failure indication for a time period. In one implementation, when the MAC entity considers LBT for a UL transmission attempt as successful, the MAC entity may reset the LBT failure counter (e.g., set the LBT failure counter to 0). In one implementation, the UE (or the MAC entity of the UE) may reset the LBT failure counter when the MAC entity indicates an LBT failure problem to an upper layer (e.g., an RRC layer). In one implementation, the UE may stop the LBT failure counter when the MAC entity indicates the LBT failure problem to the upper layer.

[0043] In one implementation, the UE may reset the LBT failure counter when the UE

performs a re-establishment procedure. In one implementation, the UE may reset the LBT failure counter when the UE switches to another carrier, BWP, channel, or LBT unit. In one implementation, the UE may reset the LBT failure counter when a reconfiguration is received related to LBT failure handling (e.g., when at least one of the time period in action 108 and the threshold in action 106 is reconfigured). In one implementation, the UE may reset the LBT failure counter when a reset of the MAC entity is requested (e.g., requested by the upper layers). In one implementation, the UE may reset the LBT failure counter when an operating condition changes, such as a change in the operating (or serving) LBT channel, sub-band, BWP, carrier, or cell. In one implementation, the UE may reset the LBT failure counter upon RRC state transition (e.g., from the RRC_IDLE state to the RRC_CONNECTED state or from the RRC_INACTIVE state to the RRC_CONNECTED state).

[0044] Fig. 2 is a flowchart of an example method 200 for updating an LBT failure counter performed by a UE, according to an example implementation of the present application. In action 202, the UE may receive a configuration that indicates at least one of the time period (used in action 108 of method 100) and the threshold (used in action 106 of method 100). The configuration may be transmitted via dedicated signaling (e.g., RRC signaling) or broadcast in system information. In action 204, the UE may perform a process for LBT failure detection that may be similar to method 100 shown in Fig. 1. Actions 206, 208 and 210 may correspond to three possible conditions to reset the LBT failure counter. In action 206, the UE may reset the LBT failure counter when at least one of the time period and the threshold is reconfigured (e.g., when the UE receives an RRC reconfiguration message that changes at least one of the time period and the threshold). In action 208, the UE may reset the LBT failure counter when the UE switches to another BWP. In action 210, the UE may reset the LBT failure counter when a reset of the MAC entity is requested. It should be noted that although actions 206, 208, and 210 are delineated as separate actions represented as independent blocks in Fig. 2, these separately delineated actions should not be construed as necessarily order dependent. The order in which the actions are performed in Fig. 2, is not intended to be construed as a limitation. Moreover, one or more of the actions 206, 208, and 210 may be omitted in some of the present implementations.

[0045] In one implementation, when an upper layer (e.g., the RRC layer) receives an LBT failure problem indication or the LBT failure event occurs because the LBT failure counter is greater than or equal to kI , the UE (e.g., the RRC layer of the UE) may perform at least one of the

following actions based on configurations or pre-defined rules: perform a Radio Link Failure (RLF) recovery procedure, perform a re-establishment procedure, and switch an active BWP of the UE to another BWP or carrier. For example, when the LBT failure event occurs, the UE may switch the active UL BWP to another UL BWP. In one implementation, when the LBT failure event occurs, the UE may switch the active UL BWP to another UL BWP configured with common RACH resources. In some implementations, the UE may transmit an RRC re-establishment request in response to the LBT failure event. In one implementation, if a re-establishment procedure is performed due to an LBT failure problem, the UE may transmit an RRC re-establishment request (e.g., the *RRCReestablishmentRequest* message) indicating a re-establishment cause as LBT failure. In one implementation, the LBT failure problem indication is common for all operations. In another implementation, there is one specific LBT failure problem indication for each operation. When the upper layer receives the LBT failure problem indication for one specific operation, the upper layer may perform a specific action (e.g., triggering re-establishment procedure, triggering RLF recovery procedure, and/or switching to another carrier/BWP) based on the specific operation.

15 **[0046]** Fig. 3 is a flowchart of an example method 300 performed by a UE after determining an LBT failure event occurs, according to an example implementation of the present application. Action 106 shown in Fig. 3 may be corresponding to action 106 shown in Fig. 1. After the UE determines the LBT failure event occurs, there may be several implementations for the UE to respond to such situation. In one implementation, the UE may perform action 302 to switch an active (UL) BWP of the UE to another (UL) BWP. In one implementation, the UE may perform action 304, where the MAC entity of the UE may indicate an LBT failure problem to an upper layer (e.g., the RRC layer). It should be noted that action 302 and action 304 are not construed as necessarily order dependent. Moreover, both of action 302 and action 304 may be optionally performed in some of the present implementations.

25 **[0047]** In one implementation, when an upper layer (e.g., the RRC layer) receives an LBT failure problem indication or the LBT failure event occurs because the LBT failure counter is greater than or equal to the threshold, the UE (e.g., the RRC layer of the UE) may transmit an LBT failure problem report to the network. The LBT failure problem report may include information of which LBT channel/carrier/BWP/unit suffers from the LBT failure problem, or which operation suffers from the LBT failure problem. In dual connectivity mode (or MR-DC mode), if a UE determines an LBT failure problem on a Primary Secondary Cell (PSCell) or a Secondary Cell

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Group (SCG) operating on an unlicensed spectrum, the UE may send an LBT failure problem report or an SCG failure report (including information of the LBT failure problem) to the master node (which may operate on the licensed spectrum or the unlicensed spectrum). In dual connectivity mode (or MR-DC mode), if a UE determines an LBT failure problem on a Primary
 5 Cell (PCell) or a Master Cell Group (MCG) operating on the unlicensed spectrum, the UE may send an LBT failure problem report or an MCG failure report (including information of the LBT failure problem) to the secondary node (which may operate on licensed spectrum or unlicensed spectrum).

[0048] Fig. 4 is a flowchart of an example method 400 performed by a UE when an LBT
 10 failure problem is indicated to an upper layer, according to an example implementation of the present application. Action 304 shown in Fig. 4 may be corresponding to action 304 shown in Fig. 3. After the MAC entity of the UE indicates the LBT failure problem to an upper layer (e.g., the RRC layer), the UE (e.g., the RRC layer of the UE) may perform an RLF recovery procedure in action 402. In one implementation, the UE may trigger an MCG RLF recovery procedure (e.g.,
 15 action 404) when the LBT failure event takes place in a PCell, and the UE may trigger an SCG RLF recovery procedure (e.g., action 406) when the LBT failure event takes place in a PSCell. In action 404, the UE may perform a re-establishment procedure by transmitting an RRC re-establishment request message indicating a re-establishment cause as LBT failure when the LBT failure event occurs in a PCell. In action 406, the UE may transmit, to a master node, an SCG
 20 failure report indicating the LBT failure problem when the LBT failure event occurs in a PSCell. It should be noted that action 404 and action 406 are not construed as necessarily order dependent. Moreover, action 404 and/or action 406 may be optionally omitted in some of the present implementations.

[0049] In one implementation, there may be an LBT failure indication but no LBT success
 25 indication. When there is no LBT success indication, there may be an LBT success timer. In one implementation, an expiry time for the LBT success timer may correspond to the time period in action 108. In one implementation, when the MAC entity instructs a lower layer (e.g., the PHY layer) to start an UL transmission attempt (e.g., transmitting a random access preamble, transmitting a msg3, transmitting a msgA, signaling an SR on one valid PUCCH resource, or
 30 transmitting UL data using configured grants), the MAC entity may start or restart the LBT success timer for each attempt. In one implementation, when the LBT success timer is running and the

MAC entity receives an LBT failure indication, the UE (or the MAC entity of the UE) may stop the LBT success timer and consider the attempt as unsuccessful. In one implementation, the MAC entity may start or restart the LBT success timer when the MAC entity receives an LBT failure indication from the lower layer. In one implementation, the MAC entity may consider the attempt
 5 as successful when the LBT success timer expires. In one implementation, the MAC entity may reset the LBT failure counter when the MAC entity considers the attempt as successful (e.g., when the LBT success timer expires).

[0050] In one implementation, when the MAC entity instructs a lower layer (e.g., the PHY layer) an attempt to start an UL transmission, the MAC entity may start or restart the LBT success
 10 timer for each attempt when the associated resource arrives. In one implementation, when the MAC entity indicates/instructs the lower layer to transmit a random access preamble, the MAC entity may start or restart the LBT success timer in the first symbol of the selected valid PRACH resource. In one implementation, when the MAC entity indicates/instructs the lower layer to signal an SR, the MAC entity may start or restart the LBT success timer in the first symbol of the selected
 15 valid PUCCH resource for the SR. In one implementation, when the MAC entity indicates/instructs the lower layer to transmit UL data using configured grants, the MAC entity may start or restart the LBT success timer in the first symbol of the stored uplink configured grants.

[0051] In one implementation, the UE (or the MAC entity of the UE) may start or restart the LBT success timer when the value(s) of the LBT success timer is reconfigured by the upper layer
 20 (e.g., reconfigured by RRC signaling). In one implementation, the UE may start or restart the LBT success timer when an operating condition changes, such as a change in the operating (or serving) LBT channel, sub-band, BWP, carrier, or cell.

[0052] In one implementation, there may be no LBT success indication, and the UE may decide whether LBT is successful or not based on whether a corresponding LBT failure indication
 25 is received or not. For example, when the MAC entity indicates/instructs the lower layer to transmit a random access preamble, the MAC entity may consider the LBT for this attempt as successful if the MAC layer does not receive a corresponding LBT failure indication (e.g., at the beginning of the selected valid PRACH resource or at the end of the selected valid PRACH resource). For example, when the MAC entity indicates/instructs the lower layer to signal an SR,
 30 the MAC entity may consider the LBT for the attempt as successful if the MAC entity does not receive a corresponding LBT failure indication (e.g., at the beginning of the selected valid PUCCH

resource for the SR or at the end of the selected valid PUCCH resource for the SR). For example, when the MAC entity indicates/instructs the lower layer to transmit UL data using configured grants, the MAC entity may consider the LBT for the attempt as successful if the MAC layer does not receive a corresponding LBT failure indication at the beginning of the stored uplink configured grants or at the end of the stored uplink configured grants.

[0053] In one implementation, there may be not only an LBT failure indication but also an LBT success indication. The MAC entity may increase the LBT failure counter by 1 when receiving an LBT failure indication. In one implementation, the LBT success indication may be regardless of MAC operations (e.g., RACH procedure, SR procedure), and there may be a common LBT failure counter for all MAC operations. The MAC entity may decrease the LBT failure counter by 1 for all MAC operations when receiving the LBT success indication. In one implementation, there may be different LBT failure counters for different MAC operations. The MAC entity may decrease the different LBT failure counters for different MAC operations by 1 when receiving a common LBT success indication. In one implementation, there may be different types of LBT success indications corresponding to different types of MAC operations. The MAC entity may decrease a specific LBT failure counter by 1 when receiving a corresponding LBT success indication for a specific MAC operation.

[0054] In one implementation, the MAC entity may identify which attempt a received common LBT failure indication is associated with. In one implementation, the MAC entity may identify which attempt a received common LBT success indication is associated with. In one implementation, the MAC entity may identify which attempt the received common LBT failure (or success) indication is associated with based on the timing of the resource used/selected by the attempt (e.g., the stored uplink configured grant, the selected PRACH resource, or the valid PUCCH resources for an SR).

[0055] Fig. 5 is a block diagram illustrating a node for wireless communication, in accordance with various aspects of the present application. As shown in Fig. 5, a node 500 may include a transceiver 520, a processor 528, a memory 534, one or more presentation components 538, and at least one antenna 536. The node 500 may also include an RF spectrum band module, a base station (BS) communications module, a network communications module, and a system communications management module, Input/Output (I/O) ports, I/O components, and power supply (not explicitly shown in Fig. 5). Each of these components may be in communication with

each other, directly or indirectly, over one or more buses 540. In one implementation, the node 500 may be a UE or a base station that performs various functions described herein, for example, with reference to Figs. 1 through 4.

5 **[0056]** The transceiver 520 having a transmitter 522 (e.g., transmitting/transmission circuitry) and a receiver 524 (e.g., receiving/reception circuitry) may be configured to transmit and/or receive time and/or frequency resource partitioning information. In some implementations, the transceiver 520 may be configured to transmit in different types of subframes and slots including, but not limited to, usable, non-usable and flexibly usable subframes and slot formats. The transceiver 520 may be configured to receive data and control channels.

10 **[0057]** The node 500 may include a variety of computer-readable media. Computer-readable media may be any available media that may be accessed by the node 500 and include both volatile and non-volatile media, removable and non-removable media. By way of example, and not limitation, computer-readable media may comprise computer storage media and communication media. Computer storage media include both volatile and non-volatile, removable and non-removable media implemented in any method or technology for storage of information such as
15 computer-readable instructions, data structures, program modules or data.

20 **[0058]** Computer storage media includes RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, Digital Versatile Disks (DVD) or other optical disk storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices. Computer storage media do not comprise a propagated data signal. Communication media typically embody computer-readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism and includes any information delivery media. The term “modulated data signal” means a signal that has one or more
25 of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media. Combinations of any of the above should also be included within the scope of computer-readable media.

30 **[0059]** The memory 534 may include computer-storage media in the form of volatile and/or non-volatile memory. The memory 534 may be removable, non-removable, or a combination thereof. Example memory includes solid-state memory, hard drives, optical-disc drives, and etc.

As illustrated in Fig. 5, The memory 534 may store computer-readable, computer-executable instructions 532 (e.g., software codes) that are configured to, when executed, cause the processor 528 to perform various functions described herein, for example, with reference to Figs. 1 through 4. Alternatively, the instructions 532 may not be directly executable by the processor 528 but be configured to cause the node 500 (e.g., when compiled and executed) to perform various functions described herein.

[0060] The processor 528 (e.g., having processing circuitry) may include an intelligent hardware device, e.g., a Central Processing Unit (CPU), a microcontroller, an ASIC, and etc. The processor 528 may include memory. The processor 528 may process the data 530 and the instructions 532 received from the memory 534, and information through the transceiver 520, the base band communications module, and/or the network communications module. The processor 528 may also process information to be sent to the transceiver 520 for transmission through the antenna 536, to the network communications module for transmission to a core network.

[0061] One or more presentation components 538 presents data indications to a person or other device. Examples of presentation components 538 may include a display device, speaker, printing component, vibrating component, etc.

[0062] From the above description, it is manifested that various techniques may be used for implementing the concepts described in the present application without departing from the scope of those concepts. Moreover, while the concepts have been described with specific reference to certain implementations, a person of ordinary skill in the art may recognize that changes may be made in form and detail without departing from the scope of those concepts. As such, the described implementations are to be considered in all respects as illustrative and not restrictive. It should also be understood that the present application is not limited to the particular implementations described above, but many rearrangements, modifications, and substitutions are possible without departing from the scope of the present disclosure.

CLAIMS

WHAT IS CLAIMED IS:

1. A user equipment (UE) comprising:
 - one or more non-transitory computer-readable media having computer-executable instructions embodied thereon; and
 - at least one processor coupled to the one or more non-transitory computer-readable media, the at least one processor is configured to execute the computer-executable instructions to:
 - receive, by a Medium Access Control (MAC) entity of the UE, a Listen-Before-Talk (LBT) failure indication from a lower layer for all uplink (UL) transmissions;
 - increase an LBT failure counter when the MAC entity receives the LBT failure indication;
 - determine an LBT failure event occurs when the LBT failure counter is greater than or equal to a threshold; and
 - reset the LBT failure counter after the MAC entity has not received the LBT failure indication for a time period.
2. The UE of claim 1, wherein the at least one processor is further configured to execute the computer-executable instructions to:
 - switch an active Bandwidth Part (BWP) of the UE to another BWP after determining the LBT failure event occurs.
3. The UE of claim 1, wherein the at least one processor is further configured to execute the computer-executable instructions to:
 - indicate, by the MAC entity of the UE, to an upper layer an LBT failure problem after determining the LBT failure event occurs.
4. The UE of claim 3, wherein the at least one processor is further configured to execute the computer-executable instructions to:
 - perform a Radio Link Failure (RLF) recovery procedure.

5. The UE of claim 4, wherein the at least one processor is further configured to execute the computer-executable instructions to:

perform a re-establishment procedure by transmitting a Radio Resource Control (RRC) re-establishment request message indicating a re-establishment cause as LBT failure, when the LBT failure event occurs in a Primary Cell (PCell).

6. The UE of claim 4, wherein the at least one processor is further configured to execute the computer-executable instructions to:

transmit, to a master node, a Secondary Cell Group (SCG) failure report indicating the LBT failure problem when the LBT failure event occurs in a Primary Secondary Cell (PSCell).

7. The UE of claim 1, wherein the at least one processor is further configured to execute the computer-executable instructions to:

receive a configuration that indicates at least one of the time period and the threshold.

8. The UE of claim 1, wherein the at least one processor is further configured to execute the computer-executable instructions to:

reset the LBT failure counter when at least one of the time period and the threshold is reconfigured.

9. The UE of claim 1, wherein the at least one processor is further configured to execute the computer-executable instructions to:

reset the LBT failure counter when the UE switches to another BWP.

10. The UE of claim 1, wherein the at least one processor is further configured to execute the computer-executable instructions to:

reset the LBT failure counter when a reset of the MAC entity is requested.

11. A method for Listen-Before-Talk (LBT) failure detection performed by a User Equipment (UE), the method comprising:

receiving, by a Medium Access Control (MAC) entity of the UE, a Listen-Before-Talk

(LBT) failure indication from a lower layer for all uplink (UL) transmissions;
increasing an LBT failure counter when the MAC entity receives the LBT failure indication;
determining an LBT failure event occurs when the LBT failure counter is greater than or equal to a threshold; and
resetting the LBT failure counter after the MAC entity has not received the LBT failure indication for a time period.

12. The method of claim 11, further comprising:
switching an active Bandwidth Part (BWP) of the UE to another BWP after determining the LBT failure event occurs.

13. The method of claim 11, further comprising:
indicating, by the MAC entity of the UE, to an upper layer an LBT failure problem after determining the LBT failure event occurs.

14. The method of claim 13, further comprising:
performing a Radio Link Failure (RLF) recovery procedure.

15. The method of claim 14, further comprising:
performing a re-establishment procedure by transmitting a Radio Resource Control (RRC) re-establishment request message indicating a re-establishment cause as LBT failure, when the LBT failure event occurs in a Primary Cell (PCell).

16. The method of claim 14, further comprising:
transmitting, to a master node, a Secondary Cell Group (SCG) failure report indicating the LBT failure problem when the LBT failure event occurs in a Primary Secondary Cell (PSCell).

17. The method of claim 11, further comprising:
receiving a configuration that indicates at least one of the time period and the threshold.

18. The method of claim 11, further comprising:

resetting the LBT failure counter when at least one of the time period and the threshold is reconfigured.

19. The method of claim 11, further comprising:

resetting the LBT failure counter when the UE switches to another BWP.

20. The method of claim 11, further comprising:

resetting the LBT failure counter when a reset of the MAC entity is requested.

ABSTRACT

A method for LBT failure detection performed by a UE is provided. The method includes: receiving, by a MAC entity of the UE, an LBT failure indication from a lower layer for all UL transmissions; increasing an LBT failure counter when the MAC entity receives the LBT failure indication; determining an LBT failure event occurs when the LBT failure counter is greater than or equal to a threshold; and resetting the LBT failure counter after the MAC entity has not received the LBT failure indication for a time period.

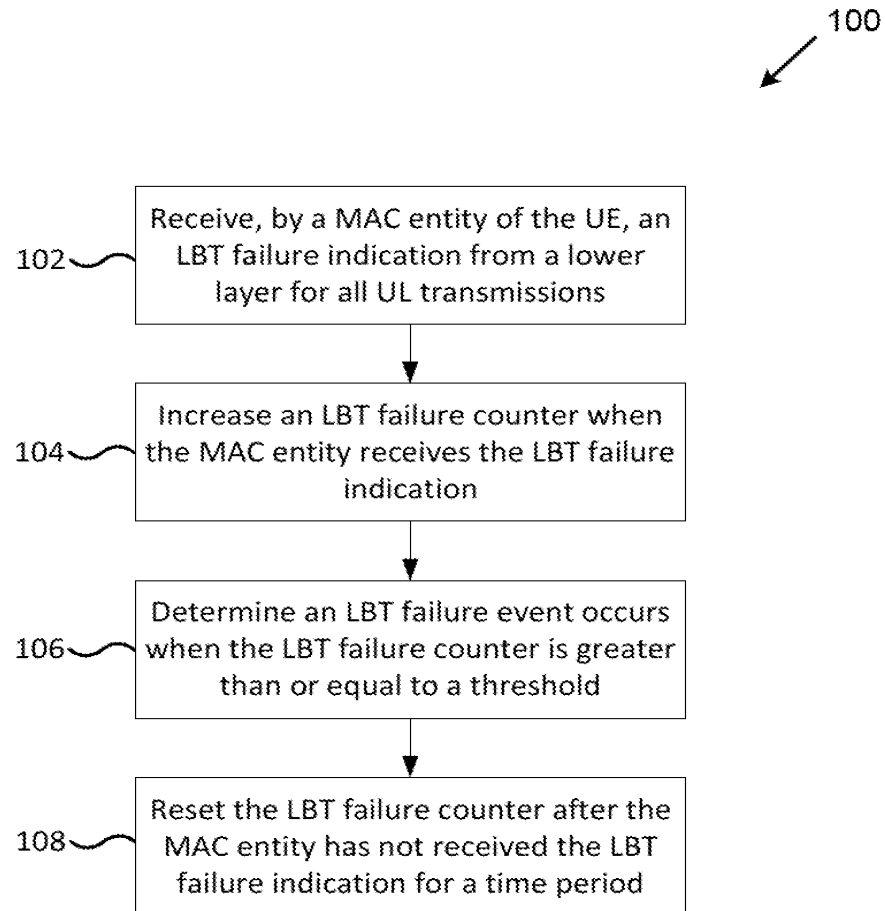


FIG. 1

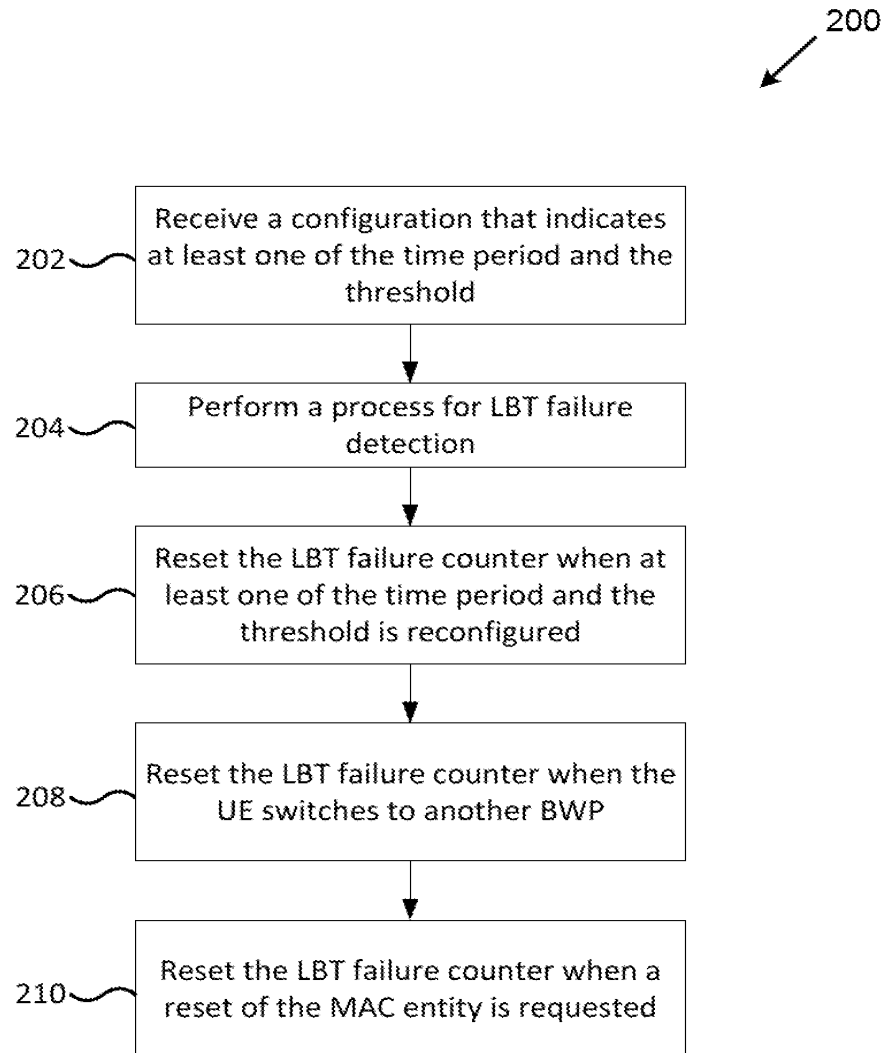


FIG. 2

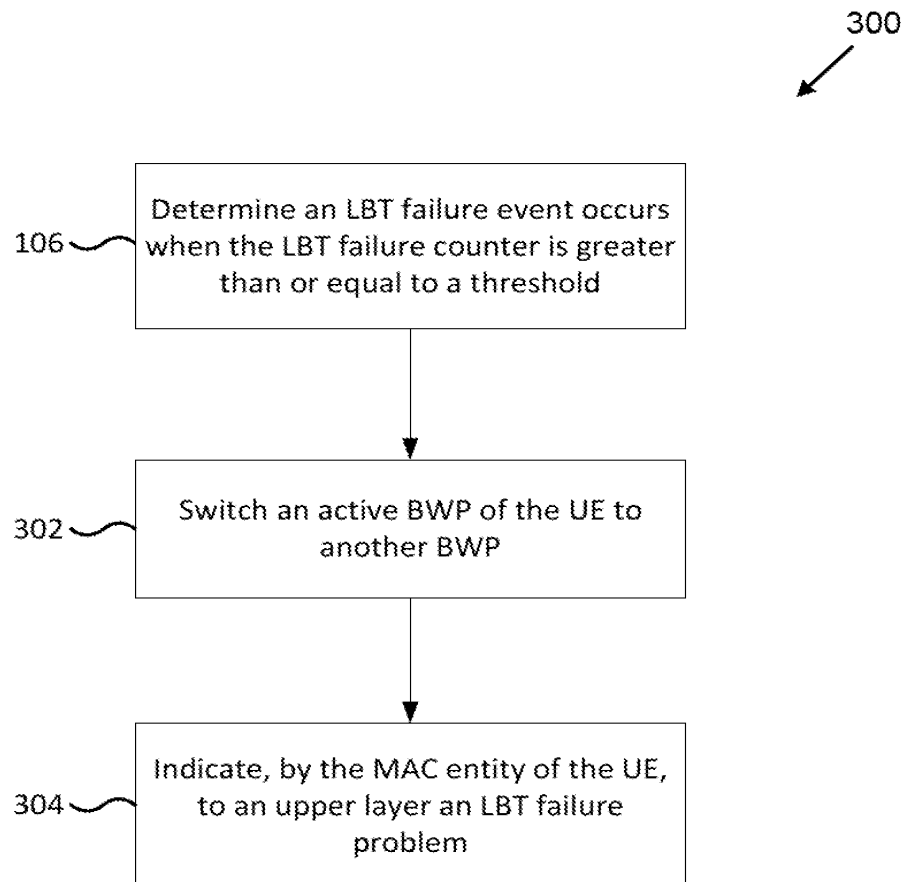


FIG. 3

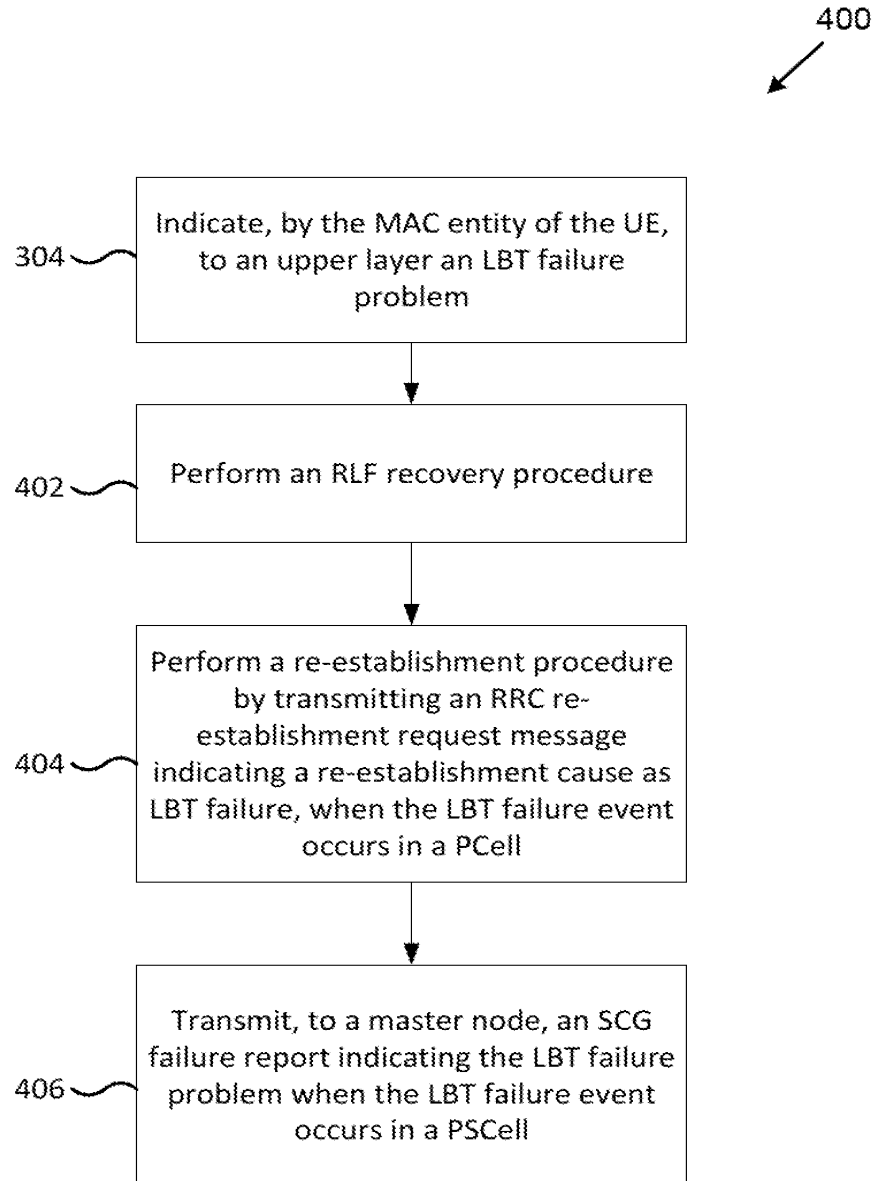


FIG. 4

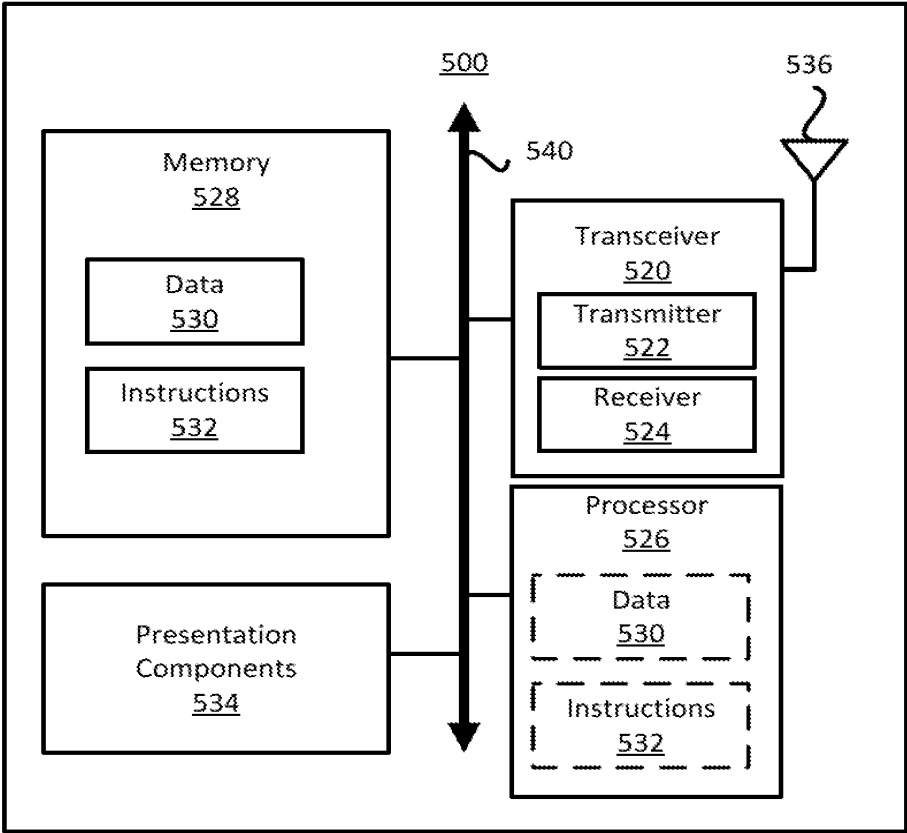


FIG. 5

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION
As the below named inventor, I hereby declare that: This declaration is directed to: ☒ The attached application, or ☐ United States application or PCT international application number _____ filed on _____. The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identify theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.	
LEGAL NAME OF INVENTOR	
Inventor: <u>CHIE-MING CHOU</u> Date (Optional): _____	
Signature: <u><i>Chie Ming Chou</i></u>	
Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1480, Alexandria, VA 22313-1480. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1480, Alexandria, VA 22313-1480.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION
As the below named inventor, I hereby declare that: This declaration is directed to: ☒ The attached application, or ☐ United States application or PCT international application number _____ filed on _____. The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.	
WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.	
LEGAL NAME OF INVENTOR Inventor: <u>CHIA-HUNG WEI</u> Date (Optional): _____ Signature: <u>CHIA HUNG WEI</u>	
Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing this form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/01 (06-12)

Approved for use through 01/31/2014. OMB 0551-0032

U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION
As the below named inventor, I hereby declare that: This declaration is directed to: ☒ The attached application, or ☐ United States application or PCT international application number _____ filed on _____. The above-identified application was made or authorized to be made by me. I believe that I am the original inventor or an original joint inventor of a claimed invention in the application. I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. WARNING: Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.	
LEGAL NAME OF INVENTOR Inventor: <u>MEI-JU SHIH</u> Date (Optional): _____ Signature: <u>Mei-Ju Shih</u>	
Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor	1				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	HUNG-CHEN		CHEN		
Residence Information (Select One) US Residency • Non US Residency Active US Military Service					
City	Hsinchu	Country of Residence ⁱ		TW	
Mailing Address of Inventor:					
Address 1		4F., No.87, Ln. 28, Sec. 1, Tiedao Rd., East Dist.			
Address 2					
City	Hsinchu	State/Province			
Postal Code	300	Country ⁱ	TW		
Inventor	2				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	CHIE-MING		CHOU		
Residence Information (Select One) US Residency • Non US Residency Active US Military Service					
City	Hsinchu	Country of Residence ⁱ		TW	
Mailing Address of Inventor:					
Address 1		5F-1, NO. 5, HSIN-AN RD.			
Address 2		HSINCHU SCIENCE-BASED INDUSTRIAL PARK, TAIWAN			
City	Hsinchu	State/Province			
Postal Code	300	Country ⁱ	TW		
Inventor	3				Remove
Legal Name					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		

Prefix	Given Name	Middle Name	Family Name	Suffix
	CHIA-HUNG		WEI	
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service				
City	Hsinchu	Country of Residence ⁱ	TW	

Mailing Address of Inventor:

Address 1	5F-1, NO. 5, HSIN-AN RD.,			
Address 2	HSINCHU SCIENCE-BASED INDUSTRIAL PARK, TAIWAN			
City	Hsinchu	State/Province		
Postal Code	300	Country ⁱ	TW	
Inventor	4			Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	MEI-JU		SHIH	
Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service				
City	Hsinchu	Country of Residence ⁱ	TW	

Mailing Address of Inventor:

Address 1	5F-1, NO. 5, HSIN-AN RD.,			
Address 2	HSINCHU SCIENCE-BASED INDUSTRIAL PARK			
City	Hsinchu	State/Province		
Postal Code	300	Country ⁱ	TW	

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ An Address is being provided for the correspondence information of this application.

Customer Number	54000		
Email Address	ea-proce@scienbizip.com	Add Email	Remove Email
Email Address	ea-cbd@scienbizip.com	Add Email	Remove Email
Email Address	ea-procc@scienbizippc.com		Remove Email

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		

Application Information:

Title of the Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		
Attorney Docket Number	US78684	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	1

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	54000		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Claims benefit of provisional	62/790099	2019-01-09
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)	Remove
Additional Foreign Priority Data may be generated within this form by selecting the Add button.				Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. ☐ NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.
--

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1		Remove	
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
		Clear	
☒ Assignee	Legal Representative under 35 U.S.C. 117		Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	FG Innovation Company Limited		
Mailing Address Information For Applicant:			
Address 1	Flat 2623, 26/F Tuen Mun Central Square		
Address 2	22 Hoi Wing Road, Tuen Mun, New Territories		
City	Tuen Mun	State/Province	
Country	HK	Postal Code	
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		

Assignee	1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
Remove				
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country i		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add				

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Alvin Koan/		Date (YYYY-MM-DD)	2020-01-08
First Name	Alvin	Last Name	Koan	Registration Number
				68468
Additional Signature may be generated within this form by selecting the Add button. Add				

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	US78684
		Application Number	
Title of Invention	METHOD AND APPARATUS FOR LBT FAILURE DETECTION		

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		METHOD AND APPARATUS FOR LBT FAILURE DETECTION		
First Named Inventor/Applicant Name:		HUNG-CHEN CHEN		
Filer:		Alvin Sean Koan		
Attorney Docket Number:		US78684		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	300	300
UTILITY SEARCH FEE	1111	1	660	660
UTILITY EXAMINATION FEE	1311	1	760	760
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1720

Electronic Acknowledgement Receipt	
EFS ID:	38243781
Application Number:	16737787
International Application Number:	
Confirmation Number:	8326
Title of Invention:	METHOD AND APPARATUS FOR LBT FAILURE DETECTION
First Named Inventor/Applicant Name:	HUNG-CHEN CHEN
Customer Number:	54000
Filer:	Alvin Sean Koan
Filer Authorized By:	
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	US78684200108POA.pdf	1138447	no	2
			ffee6bc858115e9810eb0c73dda29445e01390d9		
Warnings:					
Information:					
2	Specification	US78684200108_Spec.pdf	129702	no	17
			7ea476e3c88ab017939c1d1a3b403c5875137f14		
Warnings:					
Information:					
3	Claims	US78684200108_Clms.pdf	32380	no	4
			96d5c2ef4fbf0ea383d4391c25cf04fb5f4561940		
Warnings:					
Information:					
4	Abstract	US78684200108_Abst.pdf	17076	no	1
			422aff3ccea5332a4f1f3b623bbc87fcc282062		
Warnings:					
Information:					
5	Drawings-only black and white line drawings	US78684200108_draw.pdf	260775	no	5
			b6ccd302634046d26e702357ccb4abbfe56c8094		
Warnings:					
Information:					
6	Oath or Declaration filed	US78684200107DEC.pdf	1721677	no	4
			1e57b62d3aafb65e568f081cb9795e22c64472f1		
Warnings:					
Information:					

7	Application Data Sheet	US78684__ADS.pdf	1792897	no	9
			734dd2e96861e293efde3d662eda055cd55e8b0bd		
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	34574	no	2
			c1d83d2a577a76b216e59calf663ce95c67c7dac		
Warnings:					
Information:					
Total Files Size (in bytes):			5127528		
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