an Add Traffic Stream (ADDTS) Request/Response exchange). A Block Ack agreement for the corresponding TIDs also needs to be performed (via an Add Block Ack (ADDBA) Request/Response exchange).

SUMMARY

[0004] One non-limiting example facilitates providing a multi-band communication device which includes at least a plurality of transceivers and Media Access Control (MAC) circuitry. In operation, the transceivers each transmit signal frames on different ones of a plurality of frequency bands. The MAC circuitry is coupled to the transceivers and, in operation, receives a multi-band block acknowledgement frame on one of the plurality of frequency bands acknowledging the signal frames transmitted on the plurality of frequency bands.

[0005] Another non-limiting example facilitates providing a multi-band communication device which includes the plurality of transceivers and the Media Access Control (MAC) circuitry wherein the MAC circuitry, in operation, generates and transmits a multi-band block acknowledgement frame on one of the plurality of frequency bands acknowledging the signal frames received on the plurality of frequency bands.

[0005a] In one aspect, the present disclosure refers to a multi-band transmitter device comprising: a transmitter which transmits, to a multi-band reception device, a plurality of Medium Access Control (MAC) layer Protocol Data Units (MPDUs) which belong to a single Traffic Identifier (TID) over a plurality of frequency bands; and a receiver which receives, on a first frequency band, a multi-band block ack frame indicating reception statuses of the plurality of MPDUs including one or more MPDUs transmitted over a certain frequency band, the first frequency band being different from the certain

frequency band, wherein the receiver receives, on a single frequency band, a per-band block ack frame indicating a reception status of only an MPDU transmitted over the single frequency band among the plurality of frequency bands, the only MPDU being one of the plurality of MPDUs which belong to the single TID.

[0005b] In another aspect, the present disclosure refers to a communication method for a multi-band transmitter device, the communication method comprising: transmitting, to a multi-band reception device, a plurality of Medium Access Control (MAC) layer Protocol Data Units (MPDUs) which belong to a single Traffic Identifier (TID) over a plurality of frequency bands; receiving, on a first frequency band, a multi-band block ack frame indicating reception statuses of the plurality of MPDUs including one or more MPDUs transmitted over a certain frequency band, the first frequency band being different from the certain frequency band; and receiving, on a single frequency band, a per-band block ack frame indicating a reception status of only an MPDU transmitted over the single frequency band among the plurality of frequency bands, the only MPDU being one of the plurality of MPDUs which belong to the single TID.

[0006] It should be noted that general or specific examples may be implemented as a system, a method, an integrated circuit, a computer program, a storage medium, or any selective combination thereof. 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

What is claimed is:

1. A multi-band transmitter device comprising:

a transmitter which transmits, to a multi-band reception device, a plurality of Medium Access Control (MAC) layer Protocol Data Units (MPDUs) which belong to a single Traffic Identifier (TID) over a plurality of frequency bands; and

a receiver which receives, on a first frequency band, a multi-band block ack frame indicating reception statuses of the plurality of MPDUs including one or more MPDUs transmitted over a certain frequency band, the first frequency band being different from the certain frequency band,

wherein the receiver receives, on a single frequency band, a per-band block ack frame indicating a reception status of only an MPDU transmitted over the single frequency band among the plurality of frequency bands, the only MPDU being one of the plurality of MPDUs which belong to the single TID.

2. The multi-band transmitter device of claim 1, wherein a single multi-band block ack agreement for the TID is established by exchanging an Add Traffic Stream (ADDTS) Request frame and an Add Traffic Stream (ADDTS) Response frame between the multi-band transmitter device and the multi-band reception device.

3. The multi-band transmitter device of claim 1, wherein the receiver receives a per-band block ack indicating a reception status of a subset of the MPDUs transmitted over a certain frequency band, on a different frequency band.

4. The multi-band transmitter device of claim 1, wherein the plurality of MPDUs can be transmitted on any of the plurality of frequency bands.

5. The multi-band transmitter device of claim 1, wherein, in response to receiving the multi-band block ack frame indicating failure of reception of a first MPDU transmitted over the first frequency band among the plurality of frequency bands, the transmitter retransmits the first MPDU on a second frequency band among the plurality of frequency bands, the second frequency band being different from the first frequency band among the plurality of frequency bands.

6. The multi-band transmitter device of claim 5, wherein the transmitter transmits a multi-band block ack request frame that includes one or more per-band information fields, each of the one or more per-band information fields comprising a TID field for indicating the TID for which a block ack response is requested.

7. A communication method for a multi-band transmitter device, the communication method comprising:

transmitting, to a multi-band reception device, a plurality of Medium Access Control (MAC) layer Protocol Data Units (MPDUs) which belong to a single Traffic Identifier (TID) over a plurality of frequency bands;

receiving, on a first frequency band, a multi-band block ack frame indicating reception statuses of the plurality of MPDUs including one or more MPDUs transmitted over a certain frequency band, the first frequency band being different from the certain frequency band; and

receiving, on a single frequency band, a per-band block ack frame indicating a reception status of only an MPDU transmitted over the single frequency band among the plurality of frequency bands, the only MPDU being one of the plurality of MPDUs which belong to the single TID.

8. The communication method of claim 7, wherein a single multi-band block ack agreement for the TID is established by exchanging an Add Traffic Stream (ADDTS) Request frame and an Add Traffic Stream (ADDTS) Response frame between on the multi-band transmitter device and the multi-band reception device.

9. The communication method of claim 7, comprising:

receiving a per-band block ack indicating a reception status of a subset of the MPDUs transmitted over a certain frequency band, on a different frequency band.

10. The communication method of claim 7, wherein the plurality of MPDUs can be transmitted on any of the plurality of frequency bands.

11. The communication method of claim 7, comprising:

in response to receiving the multi-band block ack frame indicating failure of reception of a first MPDU transmitted over the first frequency band among the plurality of frequency bands, retransmitting the first MPDU on a second frequency band among the plurality of frequency bands, the second frequency band being different from the first frequency band among the plurality of frequency bands.

12. The communication method of claim 11, comprising:

transmitting a multi-band block ack request frame that includes one or more per-band information fields, each of the one or more per-band information fields comprising a TID field for indicating the TID for which a block ack response is requested.