

CLAIMS

What is claimed is:

- 1 1. A method for wireless communication, comprising:
2 receiving, by a user equipment (UE), a grant indicating allocated uplink
3 resources of an uplink shared channel for an uplink transmission, the allocated uplink
4 resources including resources allocated for transmission of uplink control information (UCI)
5 and lacking resources allocated for transmission of other uplink shared channel information;
6 identifying, based at least in part on one or more of a modulation order or code
7 rate for the UCI indicated in the grant, a number of bits per resource element (BPRE) for the
8 UCI; and
9 determining, based at least in part on the BPRE, an uplink power for
10 transmission of the UCI.
- 1 2. The method of claim 1, wherein the identifying further comprises:
2 determining the BPRE based at least in part on a product of the code rate and
3 the modulation order indicated in the grant.
- 1 3. The method of claim 1, wherein the identifying further comprises:
2 determining the BPRE as multiple of the code rate, wherein the multiple is a
3 function of the modulation order indicated in the grant.
- 1 4. The method of claim 1, wherein the identifying further comprises:
2 identifying the BPRE based at least in part on a mapping between a
3 modulation and coding scheme (MCS) indicated in the grant and a spectral efficiency.
- 1 5. The method of claim 4, wherein the MCS is indicated as an MCS index
2 value in the grant, and wherein the spectral efficiency is mapped to the MCS index value.
- 1 6. The method of claim 5, wherein the mapping is provided in a
2 preconfigured look-up table.
- 1 7. The method of claim 1, wherein the identifying further comprises:
2 calculating a transport block size for the transmission of the UCI based at least
3 in part on the code rate, the modulation order, and a number of resource blocks (RBs)
4 allocated for the transmission of the UCI; and

5 determining the BPRE based on a ratio between the calculated transport block
6 size and a number of resource elements to be used for the transmission of the UCI.

1 8. The method of claim 7, wherein the BPRE is determined by dividing
2 the transport block size by the number of resource elements.

1 9. The method of claim 8, wherein the number of resource elements is
2 determined based at least in part on the number of RBs indicated in the grant and a number of
3 symbols in transmission period for the transmission of the UCI.

1 10. The method of claim 8, wherein the transport block size is determined
2 according to a preconfigured transport block size calculation procedure for uplink shared
3 channel transmission having resources allocated for transmission of other uplink shared
4 channel information.

1 11. The method of claim 1, wherein the identifying further comprises:
2 identifying a number of RBs for transmission of the UCI indicated in the
3 grant; and
4 determining the BPRE further based at least in part on the number of RBs, the
5 code rate, and the modulation order.

1 12. The method of claim 1, further comprising:
2 transmitting the UCI using the determined uplink power.

1 13. The method of claim 12, wherein the UCI includes one or more of
2 acknowledgment/negative-acknowledgment (ACK/NACK) feedback information, or one or
3 more channel state information (CSI) parts.

1 14. An apparatus for wireless communication, comprising:
2 means for receiving, by a user equipment (UE), a grant indicating allocated
3 uplink resources of an uplink shared channel for an uplink transmission, the allocated uplink
4 resources including resources allocated for transmission of uplink control information (UCI)
5 and lacking resources allocated for transmission of other uplink shared channel information;
6 means for identifying, based at least in part on one or more of a modulation
7 order or code rate for the UCI indicated in the grant, a number of bits per resource element
8 (BPRE) for the UCI; and

9 means for determining, based at least in part on the BPRE, an uplink power for
10 transmission of the UCI.

1 15. The apparatus of claim 14, wherein the means for identifying
2 determines the BPRE based at least in part on a product of the code rate and the modulation
3 order indicated in the grant.

1 16. The apparatus of claim 14, wherein the means for identifying
2 determines the BPRE as multiple of the code rate, wherein the multiple is a function of the
3 modulation order indicated in the grant.

1 17. The apparatus of claim 14, wherein the means for identifying identifies
2 the BPRE based at least in part on a mapping between a modulation and coding scheme
3 (MCS) indicated in the grant and a spectral efficiency.

1 18. The apparatus of claim 17, wherein the MCS is indicated as an MCS
2 index value in the grant, and wherein the spectral efficiency is mapped to the MCS index
3 value.

1 19. The apparatus of claim 14, further comprising:
2 means for calculating a transport block size for the transmission of the UCI
3 based at least in part on the code rate, the modulation order, and a number of resource blocks
4 (RBs) allocated for the transmission of the UCI; and
5 wherein the means for determining determines the BPRE based on a ratio
6 between the calculated transport block size and a number of resource elements to be used for
7 the transmission of the UCI.

1 20. The apparatus of claim 19, wherein the BPRE is determined by
2 dividing the transport block size by the number of resource elements.

1 21. The apparatus of claim 20, wherein the number of resource elements is
2 determined based at least in part on the number of RBs indicated in the grant and a number of
3 symbols in transmission period for the transmission of the UCI.

1 22. The apparatus of claim 20, wherein the transport block size is
2 determined according to a preconfigured transport block size calculation procedure for uplink

3 shared channel transmission having resources allocated for transmission of other uplink
4 shared channel information.

1 23. The apparatus of claim 14, further comprising:
2 means for identifying a number of RBs for transmission of the UCI indicated
3 in the grant; and
4 wherein the means for determining determines the BPRE further based at least
5 in part on the number of RBs, the code rate, and the modulation order.

1 24. The apparatus of claim 14, further comprising:
2 means for transmitting the UCI using the determined uplink power.

1 25. An apparatus for wireless communication, comprising:
2 a processor;
3 memory coupled to the processor; and
4 instructions stored in the memory and executable by the processor to cause the
5 apparatus to:
6 receive, by a user equipment (UE), a grant indicating allocated uplink
7 resources of an uplink shared channel for an uplink transmission, the allocated uplink
8 resources including resources allocated for transmission of uplink control information (UCI)
9 and lacking resources allocated for transmission of other uplink shared channel information;
10 identify, based at least in part on one or more of a modulation order or code
11 rate for the UCI indicated in the grant, a number of bits per resource element (BPRE) for the
12 UCI; and
13 determine, based at least in part on the BPRE, an uplink power for
14 transmission of the UCI.

1 26. The apparatus of claim 25, wherein the instructions are further
2 executable by the processor to cause the apparatus to:
3 determine the BPRE based at least in part on a product of the code rate and the
4 modulation order indicated in the grant.

1 27. The apparatus of claim 25, wherein the instructions are further
2 executable by the processor to cause the apparatus to:

3 determine the BPRE as multiple of the code rate, wherein the multiple is a
4 function of the modulation order indicated in the grant.

1 28. The apparatus of claim 25, wherein the instructions are further
2 executable by the processor to cause the apparatus to:
3 identify the BPRE based at least in part on a mapping between a modulation
4 and coding scheme (MCS) indicated in the grant and a spectral efficiency.

1 29. The apparatus of claim 28, wherein the MCS is indicated as an MCS
2 index value in the grant, and wherein the spectral efficiency is mapped to the MCS index
3 value.

1 30. The apparatus of claim 25, wherein the instructions are further
2 executable by the processor to cause the apparatus to:
3 calculate a transport block size for the transmission of the UCI based at least
4 in part on the code rate, the modulation order, and a number of resource blocks (RBs)
5 allocated for the transmission of the UCI; and
6 determine the BPRE based on a ratio between the calculated transport block
7 size and a number of resource elements to be used for the transmission of the UCI.

1 31. The apparatus of claim 30, wherein the BPRE is determined by
2 dividing the transport block size by the number of resource elements.

1 32. The apparatus of claim 31, wherein the number of resource elements is
2 determined based at least in part on the number of RBs indicated in the grant and a number of
3 symbols in transmission period for the transmission of the UCI.

1 33. The apparatus of claim 31, wherein the transport block size is
2 determined according to a preconfigured transport block size calculation procedure for uplink
3 shared channel transmission having resources allocated for transmission of other uplink
4 shared channel information.

1 34. The apparatus of claim 25, wherein the instructions are further
2 executable by the processor to cause the apparatus to:
3 identify a number of RBs for transmission of the UCI indicated in the grant;
4 and

5 determine the BPRE further based at least in part on the number of RBs, the
6 code rate, and the modulation order.

1 35. The apparatus of claim 25, wherein the instructions are further
2 executable by the processor to cause the apparatus to:
3 transmit the UCI using the determined uplink power.

1 36. A non-transitory computer-readable medium storing code for wireless
2 communication, the code comprising instructions executable by a processor to:
3 receive, by a user equipment (UE), a grant indicating allocated uplink
4 resources of an uplink shared channel for an uplink transmission, the allocated uplink
5 resources including resources allocated for transmission of uplink control information (UCI)
6 and lacking resources allocated for transmission of other uplink shared channel information;
7 identify, based at least in part on one or more of a modulation order or code
8 rate for the UCI indicated in the grant, a number of bits per resource element (BPRE) for the
9 UCI; and
10 determine, based at least in part on the BPRE, an uplink power for
11 transmission of the UCI.