**3GPP TSG-RAN WG1 Meeting #**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** | **16.6.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Clarification on SL power control and SL type-1 HARQ-ACK codebook in out of coverage case | | | | | | | | | |
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| ***Source to WG:*** | Moderator(vivo), Huawei, HiSilicon, Ericsson, OPPO | | | | | | | | | |
| ***Source to TSG:*** | R1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** |  | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | |  |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | The power control procedures in clauses 16.2.0, 16.2.1, and 16.2.3 were originally intended for the power control of SL transmissions on the SL BWP in both IC and OOC cases. However, the current spec specifies that these clauses are used for SL transmission on a SL BWP of *a serving cell c*, which seems to imply IC case only.  It is stated in clause 16.5.1.1 of 38.213 that the procedure for type-1 codebook generation on PUCCH is applied for a SL BWP on a serving cell c. However, the type-1 HARQ-ACK codebook should also be supported when the SL BWP is on the ITS band which is not considered as a serving cell. | | | | | | | | |
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| ***Summary of change:*** | | Clarify that procedures for power control are applied to the transmission on SL BWP with/without serving cell. Subscript ‘b’ and ‘c’ are removed to keep consistency.  Clarify that procedure for type1 codebook generation is applied to the transmission on SL BWP with/without serving cell. | | | | | | | | |
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| ***Consequences if not approved:*** | | It remains unclear how to perform power control of SL transmission on a SL BWP in the case without a serving cell.  It remains unclear how to generate type1 HARQ-ACK codebook if the SL BWP is on the ITS band. | | | | | | | | |
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| ***Clauses affected:*** | | 16.2.0, 16.2.1, 16.2.2, 16.2.3, 16.5.1.1 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
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| ***Other comments:*** | | Isolated impact  This CR aligns with the common understanding in RAN1. | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

### 16.2.0 S-SS/PSBCH blocks

A UE determines a power for an S-SS/PSBCH block transmission occasion in slot on active SL BWP of carrier as

[dBm]

where

- is defined in [8-1, TS 38.101-1]

- is a value of *dl-P0-PSBCH* if provided; else,

- is a value of *dl-Alpha-PSBCH*, if provided; else,

- when the active SL BWP is on a serving cell , as described in clause 7.1.1 except that

- the RS resource is the one the UE uses for determining a power of a PUSCH transmission scheduled by a DCI format 0\_0 in serving cell when the UE is configured to monitor PDCCH for detection of DCI format 0\_0 in serving cell

- the RS resource is the one corresponding to the SS/PBCH block the UE uses to obtain MIB when the UE is not configured to monitor PDCCH for detection of DCI format 0\_0 in serving cell

- is a number of resource blocks for a S-SS/PSBCH block transmission with SCS configuration

### 16.2.1 PSSCH

A UE determines a power for a PSSCH transmission on a resource pool in symbols where a corresponding PSCCH is not transmitted in PSCCH-PSSCH transmission occasion on active SL BWP of carrier as:

[dBm]

where

- is defined in [8-1, TS 38.101-1]

- is determined by a value of *sl-MaxTransPower* based on a priority level of the PSSCH transmission and a CBR range that includes a CBR measured in slot [6, TS 38.214]; if *sl-MaxTransPower-r16* is not provided, then ;

- if *dl-P0-PSSCH-PSCCH* is provided

- [dBm]

- else

- [dBm]

where

- is a value of *dl-P0-PSSCH-PSCCH* if provided

- is a value of *dl-Alpha-PSSCH-PSCCH*, if provided; else,

- when the active SL BWP is on a serving cell , as described in clause 7.1.1 except that

- the RS resource is the one the UE uses for determining a power of a PUSCH transmission scheduled by a DCI format 0\_0 in serving cell when the UE is configured to monitor PDCCH for detection of DCI format 0\_0 in serving cell

- the RS resource is the one corresponding to the SS/PBCH block the UE uses to obtain MIB when the UE is not configured to monitor PDCCH for detection of DCI format 0\_0 in serving cell

- is a number of resource blocks for the PSSCH transmission occasion and is a SCS configuration

- if *sl-P0-PSSCH-PSCCH* is provided and if a SCI format scheduling the PSSCH transmission includes a cast type indicator field indicating unicast

- [dBm]

- else

- [dBm]

where

- is a value of *sl-P0-PSSCH-PSCCH*, if provided

- is a value of *sl-Alpha-PSSCH-PSCCH*, if provided; else,

- , where

- is obtained from a PSSCH transmit power per RE summed over the antenna ports of the UE, higher layer filtered across PSSCH transmission occasions using a filter configuration provided by *sl-filterCoefficient*, and

- is a RSRP, as defined in [7, TS 38.215], that is reported to the UE from a UE receiving the PSCCH-PSSCH transmission and is obtained from a PSSCH DM-RS using a filter configuration provided by *sl-filterCoefficient*

- is a number of resource blocks for PSCCH-PSSCH transmission occasion and is a SCS configuration

The UE splits the power equally across the antenna ports on which the UE transmits the PSSCH with non-zero power.

A UE determines a power for a PSSCH transmission on a resource pool in the symbols where a corresponding PSCCH is transmitted in PSCCH-PSSCH transmission occasion on active SL BWP of carrier as

[dBm]

where is a number of resource blocks for the corresponding PSCCH transmission in PSCCH-PSSCH transmission occasion .

The UE splits the power equally across the antenna ports on which the UE transmits the PSSCH with non-zero power.

### 16.2.2 PSCCH

A UE determines a power for a PSCCH transmission on a resource pool in PSCCH-PSSCH transmission occasion as

[dBm]

where

- is specified in clause 16.2.1

- is a number of resource blocks for the PSCCH transmission in PSCCH-PSSCH transmission occasion

- is a number of resource blocks for PSCCH-PSSCH transmission occasion *i*

### 16.2.3 PSFCH

A UE with scheduled PSFCH transmissions, and capable of transmitting a maximum of PSFCHs, determines a number of simultaneous PSFCH transmissions and a power for a PSFCH transmission , , on a resource pool in PSFCH transmission occasion on active SL BWP of carrier s

- if *dl-P0-PSFCH* is provided,

[dBm]

where

- is a value of *dl-P0-PSFCH*

- is a value of *dl-Alpha-PSFCH*, if provided; else,

- when the active SL BWP is on a serving cell , as described in clause 7.1.1 except that

- the RS resource is the one the UE uses for determining a power of a PUSCH transmission scheduled by a DCI format 0\_0 in serving cell when the UE is configured to monitor PDCCH for detection of DCI format 0\_0 in serving cell

- the RS resource is the one corresponding to the SS/PBCH block the UE uses to obtain MIB when the UE is not configured to monitor PDCCH for detection of DCI format 0\_0 in serving cell

- if

- if , where is determined for PSFCH transmissions according to [8-1, TS 38.101-1]

- and [dBm]

- else

- UE autonomously determines PSFCH transmissions with ascending priority order as described in clause 16.2.4.2 such that where  is a number of PSFCHs with priority value and is defined as

- the largest value satisfying where is determined according to [8-1, TS 38.101-1] for transmission of all PSFCHs assigned with priority values 1, 2, …, , if any

- zero, otherwise

and

[dBm]

where is defined in [8-1, TS 38.101-1] and is determined for the PSFCH transmissions

- else

- the UE autonomously selects PSFCH transmissions with ascending priority order as described in clause 16.2.4.2

- if , where is determined for the PSFCH transmissions according to [8-1, TS 38.101-1]

- and [dBm]

- else

- the UE autonomously selects PSFCH transmissions in ascending order of corresponding priority field values as described in clause 16.2.4.2 such that where is a number of PSFCHs with priority value and is defined as

- the largest value satisfying where is determined according to [8-1, TS 38.101-1] for transmission of all PSFCHs assigned with priority values 1, 2, …, , if any

- zero, otherwise

and

[dBm]

where is determined for the simultaneous PSFCH transmissions according to [8-1, TS 38.101-1]

- else

[dBm]

where the UE autonomously determines PSFCH transmissions with ascending priority order as described in clause 16.2.4.2 such that and where is determined for the PSFCH transmissions according to [8-1, TS 38.101-1]

#### 16.5.1.1 Type-1 HARQ-ACK codebook in physical uplink control channel

For a SL BWP on a carrier, and an active UL BWP on the primary cell, as described in clause 12, a UE determines a set of occasions for candidate PSSCH transmissions with corresponding PSFCH reception occasions for which the UE can multiplex corresponding HARQ-ACK information in a PUCCH transmission in slot . The determination is based on: