**3GPP TSG RAN WG1 #101 R1-2004931**

**e-Meeting, May 25th – June 5th, 2020**

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**Source:** Moderator (LG Electronics)

**Title:** Text proposal from Email discussion thread #1 for AI 7.2.4.5 Physical layer procedures for sidelink

**Document for:** Discussion and decision

# **Introduction and proposal**

RAN1 made the agreements copied in Appendix in [101-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-01] Email discussion/approval regarding: power control. This contribution includes the text proposal endorsed. It is proposed to adopt the text proposal in Section 2 for the following reasons

* Reason for change: RAN1 made the agreements to complete the UE procedure for sidelink power control. The text proposal is to implement these agreements.
* Summary of change: DL pathloss used in the sidelink open loop power control is specified. Rules to determine the number of simultaneously transmitted PSFCH and the transmit power of each PSFCH are specified in the cases missing in the current specifications.
* Consequences if not approved: The specification is incomplete in supporting sidelink power control.

# **Text proposal**

* 1. Text proposal for TS 38.213

===========================<Start of change #1>=======================

16.2.1 PSSCH

< Unchanged parts are omitted>

where

- is a value of *p0-DL-PSCCHPSSCH* if provided

- is a value of *alpha-DL-PSCCHPSSCH*, if provided; else,

- as described in Clause 7.1.1 with following changes:

- Using the RS resource used for power control for PUSCH transmission scheduled by DCI format 0\_0 when the UE monitors DCI format 0\_0.

- Using a RS resource from the SS/PBCH block that the UE uses to obtain MIB when the UE does not monitor DCI format 0\_0.

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

< Unchanged parts are omitted>

============================<End of change #1>=======================

===========================<Start of change #2>=======================

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 as

- if *p0-DL-PSFCH* is provided,

[dBm]

where

- is a value of *p0-DL-PSFCH*

- is a value of *alpha-DL-PSFCH*, if provided; else,

- as described in Clause 7.1.1

- 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~~  where is the number of PSFCHs with priority value *i* and *K* is defined as

- the largest value satisfying where is determined according to [8-1, TS 38.101-1] for the transmissions of all the PSFCHs assigned with the priority values 1, 2, …, *K* if such a non-zero value exists for *K*~~TBD~~

- 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~~  where is the number of PSFCHs with priority value *i* and *K* is defined as

- the largest value satisfying where is determined according to [8-1, TS 38.101-1] for the transmissions of all the PSFCHs assigned with the priority values 1, 2, …, *K* if such a non-zero value exists for *K* ~~TBD~~

- zero, otherwise

and

- [dBm]

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

- else

[dBm]

where UE autonomously determines PSFCH transmissions with ascending priority order as described in Clause 16.2.4.2 such that

============================<End of change #2>=======================

# **Appendix: Agreements made in the email discussion [101-e-NR-5G\_V2X\_NRSL-SL\_PHY\_Procedure-01]**

Agreements:

For open-loop power control based on DL pathloss, the UE calculates DL pathloss using

* The RS resource used for power control for PUSCH transmission scheduled by DCI format 0\_0 when the UE monitors DCI format 0\_0.
* A RS resource from the SS/PBCH block that the UE uses to obtain MIB when the UE does not monitor DCI format 0\_0.

Agreements:

For Case 1-2 and Case 2-2 of simultaneous transmissions of PSFCH, the lower bound X of the number of actually transmitted PSFCH is given by X = max {1, Y = M\_1+M\_2+…+M\_K} where

* M\_i is the number of PSFCHs assigned with the priority value i
* K is the largest value which does not lead to the power limited case when the UE transmits all the PSFCHs with the priority value 1, 2, …, K.

Agreements:

When P\_(O,PSFCH) is not provided,

* The number of actually transmitted PSFCH N is up to UE implementation with X=1.
* The transmit power of each PSFCH is PCMAX-10log10N where PCMAX determined for the N PSFCH transmission.