**3GPP TSG-RAN WG4 Meeting #99-e revision of R4-2109665
Electronic Meeting, May 19-27, 2021**

**Agenda item: 10.1.6**

**Source: vivo**

**Title: TP to TR38.884 v0.3.0 on testing time reduction**

**Document for: Approval**

# 1 Introduction

In RAN4#98bis-e meeting, good progress on testing time reduction has been made [1][2]. RSRP(B) is feasible to find the RX beam peak search, and Single link polarization measurement is also applicable for EIRP test based on UE declaration.

This contribution provides the text proposals on testing time reduction methods to TR 38.884.

# 2 Discussion

In the last RAN4 meeting, the initial conclusions on enhanced approach has been agreed [1]:

* RSRP(B) based RX beam peak search
	+ RAN4 confirm that RSRP is feasible to find the beam peak direction
	+ Further discuss RSRP or RSRP&EIS based beam peak searching procedure
		- If RSRP is selected, further discuss whether an additional MU element is needed.
	+ Whether the test procedure of Rx beam peak search based on RSRPB for demodulation and CSI testing can be applicable is FFS
* Single Pollink
	+ For EIRP test, whether single Pollink is randomly selected (from either theta Pollink or phi Pollink) or test under 2 link directions, depends on UE declaration

Given the RSRP is feasible to find the beam peak direction, then select RSRP-based beam peak searching procedure would be a simple and direct way to go. Only issue is RAN4 may need further study whether the RSRP accuracy would have impact on the final beam peak direction.

In this contribution, we propose test procedure to adopt RSRP-based RX beam peak searching and Single link polarization measurement.

# 3 References

1. R4-2103952, “Email discussion summary for [98e][330] FR2\_enhTestMethods,” Moderator (Apple), 3GPP RAN4#98-e, Feb 2021.
2. R4-2103920, “WF on ETC and test time reduction,” vivo, 3GPP RAN4#98-e, Feb 2021.
3. R4-2104520, Discussions on FR2 test time reduction, vivo, 3GPP RAN4#98-e, Feb 2021.

# 4 Text Proposal to TR 38.884

**--------------Start of text proposal -------------**

## 8.3 RSRP(B) based RX beam peak search

RSRP(B)-based RX beam peak search approach is applicable to find the beam peak, the beam peak searching time can be reduced significantly.

### 8.3.1 Test procedure

The RX beam peak direction is found with a 3D RSRP(B) scan (separately for each orthogonal downlink polarization). The RX beam peak direction is where the maximum total component of RSRP is found. The RX beam peak direction search grid points for this single grid approach are defined in Clause 8.2.

The measurement procedure includes the following steps:

1) Select any of the three Alignment Options (1, 2, or 3) from Tables N.2-1 through N.2-3 [6] to mount the DUT inside the QZ.

2) Position the DUT in DUT Orientation 1 or 2 from Tables N.2-1 through N.2-3 [6].

3) Connect the SS (System Simulator) with the DUT through the measurement antenna with PolLink= polarization to form the RX beam towards the measurement antenna.

4) Set the DL power at the maximum power supported by the test system. Determine RSRP or RSRPBs (H and V) (~~Pol~~~~Meas~~~~=~~ PolLink= ~~for θ-polarization~~ reported by UE.

5) Connect the SS (System Simulator) with the DUT through the measurement antenna with PolLink= polarization to form the RX beam towards the measurement antenna.

6) Determine RSRP or RSRPBs (H and V) (~~Pol~~~~Meas~~~~=~~ PolLink= ~~for φ-polarization~~ reported by UE.

7) Advance to the next grid point and repeat steps 3 through 6 until measurements within the full 3D scan have been completed

8) Calculate total ~~RSRP(Pol~~~~Link~~~~= θ) = RSRP(Pol~~~~Meas~~~~= θ, Pol~~~~Link~~~~= θ) + RSRP(Pol~~~~Meas~~~~= ϕ, Pol~~~~Link~~~~= θ).~~ RSRP\_total=2/(1/ RSRP(PolLink= ) + 1/ RSRP(PolLink= )). Or linear sum four RSRPBs. The RX beam peak direction is where the maximum total component of RSRP or RSRPB.

The Peak EIS is the EIS value measured at the RX beam peak direction found by 3D RSRP(B) scan.

### 8.3.2 RSRP(B) accuracy

The RSRP(B) accuracy is FFS, assuming the SNR is higher than 17dB.

## 8.4 Single link polarization measurement

As an enhancement to the FR2 2Tx test cases, it has been proposed to adopt a Single link polarization measurement to reduce the test time. Single Pollink can be randomly selected from either theta Pollink or phi Pollink.

For EIRP test, whether single Pollink is adopted or test under 2 link directions, depends on UE declaration.

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