**3GPP TSG-RAN WG4 Meeting # 110-bis R4-2405045**

**China, Changsha, April 15 – April 19, 2024**

**Title: TP to TR 37.718-21-11: Addition of DC\_3A-28A\_n105A**

**Source: Nokia, Spark**

**Agenda item: 5.4.2**

**Document for: Approval**

# 1 Introduction

This is a TP to TR 37.718-21-11 to add DC\_3A-28A\_n105A. All fallbacks have been analysed.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Start of TP\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

## 5.x DC\_3A-28A\_n105A

### 5.x.1 Configurations for DC

Table 5.x.1-1: Inter-band DC configurations (three bands)

| **EN-DC****configuration** | **Uplink EN-DC****configuration** |
| --- | --- |
| DC\_3A-28A\_n105A | DC\_3A\_n105A |

### 5.x.2 Co-existence studies

For UE coexistence study of UL DC\_3\_n105, the 2nd, 3rd, 4th, and 5th order harmonics and the 2nd, 3rd, 4th, and 5th order inter-modulation products are calculated and presented in Table 5.x.2-1.

Based on the calculation, we identify the following interference impact:

- There is no IMD impact of UL DC\_3\_n105 on DL Band 28.

Table 5.x.2-1: The harmonic and IMD products caused by UL DC\_3\_n105

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE DL carriers** | **fx\_low** | **fx\_high** | **fy\_low** | **fy\_high** |
| DL frequency (MHz) | 1805 | 1880 | 612 | 652 |
| 3rd Band DL | 758 | 803 |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UE UL carriers** | **fx\_low** | **fx\_high** | **fy\_low** | **fy\_high** |
| UL frequency (MHz) | 1710 | 1785 | 663 | 703 |
| 2nd harmonics frequency limits | 2\*fx\_low | 2\*fx\_high | 2\* fy\_low | 2\* fy\_high |
| 2nd harmonics frequency limits (MHz)  | 3420 | 3570 | 1326 | 1406 |
| 3rd harmonics frequency limits | 3\*fx\_low | 3\*fx\_high | 3\* fy\_low | 3\* fy\_high |
| 3rd harmonics frequency limits (MHz) | 5130 | 5355 | 1989 | 2109 |
| 4th harmonics frequency limits | 4\*fx\_low | 4\*fx\_high | 4\* fy\_low | 4\* fy\_high |
| 4th harmonics frequency limits (MHz) | 6840 | 7140 | 2652 | 2812 |
| 5th harmonics frequency limits | 5\*fx\_low | 5\*fx\_high | 5\* fy\_low | 5\* fy\_high |
| 5th harmonics frequency limits (MHz) | 8550 | 8925 | 3315 | 3515 |
| 2nd order IMD products | |fy\_low – fx\_high| | |fy\_high – fx\_low| | |fy\_low + fx\_low| | |fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 1122 | 1007 | 2373 | 2488 |
| Two-tone 3rd order IMD products | |2\*fx\_low – fy\_high| | |2\*fx\_high – fy\_low| | |2\*fy\_low – fx\_high| | |2\*fy\_high – fx\_low| |
| IMD frequency limits (MHz) | 2717 | 2907 | 459 | 304 |
| Two-tone 3rd order IMD products | |2\*fx\_low + fy\_low| | |2\*fx\_high + fy\_high| | |2\*fy\_low + fx\_low| | |2\*fy\_high + fx\_high| |
| IMD frequency limits (MHz) | 4083 | 4273 | 3036 | 3191 |
| Two-tone 4th order IMD products | |3\*fx\_low –1\* fy\_high| | |3\*fx\_high – 1\*fy\_low| | |3\*fy\_low – 1\*fx\_high| | |3\*fy\_high – 1\*fx\_low| |
| IMD frequency limits (MHz) | 4427 | 4692 | 204 | 399 |
| Two-tone 4th order IMD products | |2\*fx\_low –2\* fy\_high| | |2\*fx\_high –2\* fy\_low| | |2\*fx\_low +2\* fy\_low| | |2\*fx\_high +2\* fy\_high| |
| IMD frequency limits (MHz) | 2014 | 2244 | 4746 | 4976 |
| Two-tone 4th order IMD products | |3\*fx\_low +1\* fy\_low| | |3\*fx\_high + 1\*fy\_high| | |3\*fy\_low + 1\*fx\_low| | |3\*fy\_high + 1\*fx\_high| |
| IMD frequency limits (MHz) | 5793 | 6058 | 3699 | 3894 |
| Two-tone 5th order IMD products | |fx\_low – 4\*fy\_high| | |fx\_high – 4\*fy\_low| | |fy\_low – 4\*fx\_high| | |fy\_high – 4\*fx\_low| |
| IMD frequency limits (MHz) | 1102 | 867 | 6477 | 6137 |
| Two-tone 5th order IMD products | |2\*fx\_low - 3\*fy\_high| | |2\*fx\_high - 3\*fy\_low| | |2\*fy\_low - 3\*fx\_high| | |2\*fy\_high -3\*fx\_low| |
| IMD frequency limits (MHz) | 1311 | 1581 | 4029 | 3724 |
| Two-tone 5th order IMD products | |fx\_low + 4\*fy\_low| | |fx\_high + 4\*fy\_high| | |fy\_low + 4\*fx\_low| | |fy\_high + 4\*fx\_high| |
| IMD frequency limits (MHz) | 4362 | 4597 | 7503 | 7843 |
| Two-tone 5th order IMD products | |2\*fx\_low + 3\*fy\_low| | |2\*fx\_high + 3\*fy\_high| | |2\*fy\_low + 3\*fx\_low| | |2\*fy\_high + 3\*fx\_high| |
| IMD frequency limits (MHz) | 5409 | 5679 | 6456 | 6761 |

### 5.x.3 ∆TIB and ∆RIB values

For DC\_3-28\_n105, ΔTIB,c and ΔRIB,c values are as follows (re-use values from CA\_n28-n105).

Table 5.x.3-1: ΔTIB,c

| Inter-band EN-DC configuration | ΔTIB,c for E-UTRA band / NR band (dB)6 |
| --- | --- |
| Component band in order of bands in configuration7 |
| DC\_3-28\_n105 | 0.3 | 1 | 1 |
| NOTE 6: “-” denotes ΔTIB,c = 0.NOTE 7: The component band order in the configuration should be listed by the order of E-UTRA band and NR band respectively, such as for DC\_66\_(n)12 the band order from left to right is 12, 66 and n12. |

Table 5.x.3-2: ΔRIB,c

| **Inter-band EN-DC configuration** | ΔRIB,c for E-UTRA band / NR band (dB)7 |
| --- | --- |
| Component band in order of bands in configuration8 |
| DC\_3-28\_n105 | - | 0.7 | 0.7 |
| NOTE 7: “-” denotes ΔRIB,c = 0.NOTE 8: The component band order in the configuration should be listed by the order of E-UTRA band and NR band respectively, such as for DC\_5\_(n)12 the band order from left to right is 5, 12 and n12. |

### 5.x.4 Reference sensitivity exceptions

No additional MSD requirements need to be defined.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* End of TP\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

# References