**3GPP TSG-RAN WG4 Meeting # 95-e *R4-200xxxx***

**Electronic Meeting, 25 May – 5 June 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **37.145-2** | **CR** | **0219** | **rev** | **1** | **Current version:** | **15.6.0** |  |
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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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | CR to TS 37.145-2: Corrections on generation of test configurations | | | | | | | | | |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Perf | | | | |  | ***Date:*** | | | 2020-05-15 |
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| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1) The symbol “Prated,t,TRP“ is defined as “Rated transmitter TRP declared per RIB” in clause 3.2 but not included in clause 4.10.  2) For power allocation for all test configurations except ACTR4 and ATCR6, it is stated that “For all other requirements ensure the total radiated power is PRated,c,TRP (see table 4.10-2, D11.6)”. It is not clear how to set the power of each carrier, and (D11.6) is declared as the rated carrier OTA BS power but not total radiated power per RIB. | | | | | | | | |
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| ***Summary of change:*** | | 1) Include the declaration “Rated transmitter TRP declared per RIB, Prated,t,TRP” in clause 4.10.  2) For power allocation for all test configurations except ACTR4 and ATCR6, set the power of each carrier to the same level, and use “Rated transmitter TRP declared per RIB, Prated,t,TRP“ instead of “the rated carrier OTA BS power, PRated,c,TRP“ for the total radiated power. | | | | | | | | |
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| ***Consequences if not approved:*** | | Errors remain and would lead to different interpretations. | | | | | | | | |
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| ***Clauses affected:*** | | 4,10, 4.11.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | Resubmission of endorsed Draft CR R4-2004943 | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**<Start of change>**

4.10 Manufacturer declarations

The AAS BS declarations categories D9.x and D10.x listed in table 4.10-1 are required to be provided by the manufacturer for the radiated requirements testing of the *hybrid AAS BS* or the OTA AAS BS.

For the *hybrid AAS BS* declarations required for the conducted requirements testing, refer to 3GPP TS 37.145-1 [9], subclause 4.10.

NOTE 1: D9.x declarations are related to the radiated Tx requirements, while D10.x declarations are related to the radiated Rx requirements.

NOTE 2: From Rel-15 onwards, additional D11.x declarations are introduced in table 4.10-2 for OTA AAS BS, in order to easily distinguish from the Rel-13/14 OTA declarations which are also applicable for *hybrid AAS BS*. Declarations in table 4.10-2 are applicable to OTA AAS BS only.

**Table 4.10-1: *Hybrid AAS BS* and OTA AAS BS manufacturer declarations for radiated test requirements**

| **Declaration identifier** | **Declaration** | **Description** |
| --- | --- | --- |
| D9.1 | Coordinate system reference point | Location of coordinated system reference point in reference to an identifiable physical feature of the AAS BS enclosure. |
| D9.2 | Coordinate system orientation | Orientation of the coordinate system in reference to an identifiable physical feature of the AAS BS enclosure. |
| D9.3 | Beam identifier | A unique title to identify a beam, e.g. a, b, c or 1, 2, 3.  The vendor may declare any number of beams with unique identifiers. The minimum set to declare, for conformance, correspond to the beams at the reference beam direction, with the highest intended EIRP, and covering the properties listed below:  1) A beam with the narrowest intended BeWθ, and narrowest intended BeWϕ possible when narrowest intended BeWθ is used.  2) A beam with the narrowest intended BeWϕ and narrowest intended BeWθ possible when narrowest intended BeWϕ is used.  3) A beam with the widest intended BeWθ and widest intended BeWϕ possible when widest intended BeWθ is used.  4) A beam with the widest intended BeWϕ and widest intended BeWθ possible when widest intended BeWϕ is used.  5) A beam which provides the highest intended EIRP of all possible beams.  NOTE 1: Depending on the capability of the system some of these beams may be the same. For those same beams, testing is not repeated.  When selecting the above five beam widths for declaration, all beams that the AAS BS is intended to produce shall be considered, including beams that during operation may be identified by any kind of cell or UE specific reference signals, with the exception of any type of beam that is created from a group of transmitters that are not all phase synchronised. |
| D9.4 | Operating bands and frequency ranges | List of UTRA or E-UTRA operating band(s) supported by BS and if applicable, frequency range(s) within the *operating band(s)* that the BS can operate in.  Supported bands declared for every beam (D9.3).  NOTE 2: these operating bands are related to their respective single‑band RIBs.  NOTE 3: this declaration in-directly provides information on the RAT's supported by the AAS BS. |
| D9.5 | Beam RAT support | RAT(s) supported by each beam for each supported operating band, declared for every beam identified in D9.3. |
| D9.6 | E-UTRA channel band width support | E-UTRA channel bandwidth supported. Declared for each beam (D9.3) and each E-UTRA operating band (D9.4). |
| D9.7 | *Reference beam direction pair* | The beam direction pair, describing the reference beam peak direction and the reference beam centre direction. Declared for every beam |
| D9.8 | *OTA peak directions set* | The *OTA peak directions set* for each beam. Declared for every beam identified in D9.3.  NOTE 4: In Rel-13/14 version of this specification, this declaration was called *EIRP accuracy directions set*. |
| D9.9 | Maximum steering direction(s) | The *beam direction pair(s)* corresponding to the following points:  1) The *beam peak direction* corresponding to the maximum steering from the *reference beam centre direction* in the positive *Φ* direction, while the *θ value being the closest possible to the reference beam centre direction.*  2) The beam peak direction corresponding to the maximum steering from the reference beam centre direction in the negative *Φ* direction, while the *θ value being the closest possible to the* reference beam centre direction*.*  3) The beam peak direction corresponding to the maximum steering from the reference beam centre direction in the positive *θ* direction, while the *Φ value being the closest possible to the* reference beam centre direction.  4) The beam peak direction corresponding to the maximum steering from the reference beam centre direction in the negative *θ* direction, while the *Φ value being the closest possible to the* reference beam centre direction*.*  The maximum steering direction(s) may coincide with *the reference beam centre direction*.  Declared for every beam identified in D9.3. |
| D9.10 | Rated beam EIRP | The rated EIRP level per carrier (PRated,c,EIRP) at the *beam peak direction* associated with a particular *beam direction pair* for each of the declared maximum steering directions (D9.9), as well as the *reference* *beam direction pair* (D9.7). Declared for every beam identified in D9.3. (Note 1, Note 2) |
| D9.11 | Beamwidth | The *beamwidth* for the *reference* *beam direction pair* and the four maximum steering directions. Declared for every beam identified in D9.3. |
| D9.12 | Equivalent beams | List of beams which are declared to be equivalent.  Equivalent beams imply that the beams are expected to have identical *OTA peak directions sets* and intended to have identical spatial properties at all steering directions within the *OTA peak directions set* when presented with identical signals. All declarations (D9.4‑D9.11) made for the beams are identical and the transmitter unit*,* RDN and antenna array responsible for generating the beam are of identical design. |
| D9.13 | Parallel beams | List of beams which have been declared equivalent (D9.12) and can be generated in parallel using independent RF power resources.  Independent power resources mean that the beams are transmitted from mutually exclusive transmitter units. |
| D9.14 | Number of carriers at maximum TRP | The number of carriers per operating band the AAS BS is capable of generating at maximum TRP declared each RAT (and multi-RAT) for every beam identified in D9.3. |
| D9.15 | Multi-band transceiver units | Declared if an operating band is generated using transceiver units supporting operation in multiple operating bands through common active RF components. |
| D9.16 | Operating bands with multi-band dependencies | List operating bands which are generated by multi-band transceiver units. Declared for each operating band for which multi-band transceiver units (D9.15) have been declared, |
| D9.15 | Maximum radiated Base Station RF Bandwidth | Maximum Base Station RF Bandwidth in the operating band, declared for each supported operating band identified in D9.4. |
| D9.18 | Maximum radiated Base Station RF Bandwidth for contiguous operation. | Largest Base Station RF Bandwidth for contiguous spectrum operation, declared for each supported operating band (D9.4). |
| D9.19 | Maximum radiated Base Station RF Bandwidth for non- contiguous operation. | Maximum Base Station RF Bandwidth for non-contiguous spectrum operation, declared for each supported operating band (D9.4). |
| D9.20 | Inter-band CA bands | Declared inter-band CA bands supported per operating band (D9.4). |
| D9.21 | CA only operation | Declared per operating band identified in D9.4. |
| D9.22 | Multi-carrier HSPA only operation | Declared per each supported UTRA operating band (D9.4). |
| D9.23 | Reduced number of supported carriers at maximum TRP in multi-RAT operations | Declared for each supported operating (D9.4). |
| D9.24 | Reduced maximum TRP at the total number of supported carriers in multi-RAT operations | Declared for each supported operating band (D9.4). (Note 1, Note 2) |
| D9.25 | Radiated capability set (RCSA) | The manufacturer shall declare the supported radiated capability set(s) according to table 4.9-1 for each supported operating band (D9.4).  NOTE: in case of *hybrid AAS BS*, set of *operating band* specific RCSA declarations shall be aligned with the set of CSA's declared by D6.12 in TS 37.145-1 [9] for the conducted testing for the *operating band* in question. |
| D9.26 | Maximum *Radio Bandwidth* of the operating band with multi-band dependencies | Largest *Radio Bandwidth* that can be supported by the operating bands with multi-band dependencies.  Declared for each supported operating band which has multi-band dependencies (D9.16) |
| D9.27 | Total number of supported carriers for operating bands with multi-band dependencies | Total number of supported carriers for operating bands declared to have multi-band dependencies (D9.16). |
| D9.28 | Contiguous or non-contiguous spectrum support | Ability of AAS BS to support contiguous or non-contiguous (or both) frequency distribution of carriers when operating multi-carrier in an operating band. |
| D9.29 | Non-contiguous parameters | If non-contiguous operation is supported in *operating band* () and parameters (e.g. frequency range, maximum Base Station RF Bandwidth, rated transmitter TRP, etc.) differ from the contiguous spectrum operation, then this declaration provided parameters for the non-contiguous operation. Otherwise, parameters for contiguous or non-contiguous spectrum operation in the operating band are assumed to be the same. |
| D9.30 | DL RS EIRP for conformance test | The DL RS EIRP transmitted during the DL RS power conformance test derived from the power broadcast on the DL-SCH and the AAS BS directivity in the direction to be tested. |
| D9.31 | NR BS channel band width and SCS support | NR BS channel bandwidth and SCS supported. Declared for each beam () and each operating band (). |
| D9.32 | Total RF bandwidth (BWtot) | Total RF bandwidth BWtot of transmitter and receiver, declared per the band combinations (). |
| D9.33 | Inter-band CA bands | Declared inter-band CA bands supported by the beam. Declared per beam (D.3). |
| D9.34 | CA only operation | Declared of CA-only but not multiple carriers operation, declared per *operating band* (D.4) and per beam (D.3). |
| D10.1 | OSDD identifier | A unique identifier for the OSDD. |
| D10.2 | OSDD operating band support | Operating band supported by the OSDD, declared for every OSDD identified in D10.1.  NOTE 2: As each identified OSDD has a declared minimum EIS value (D10.6), multiple operating band can be only be declared if they have the same minimum EIS declaration. |
| D10.3 | OSDD RAT support | RAT(s) supported by the OSDD for each supported operating band, declared for every OSDD identified in D10.1.  NOTE 3: If the OSDD supports multiple RAT's with different minimum EIS value (D10.6) if all other parameters are the same then different EIS values for different RATS and signal BW's may be declared for an OSDD. |
| D10.4 | OTA sensitivity E-UTRA supported channel bandwidths | The E-UTRA channel bandwidths supported by each OSDD. |
| D10.5 | Redirection of receiver target support | Ability to redirect the receiver target related to the OSDD |
| D10.6 | Minimum EIS | The minimum EIS requirement (i.e. maximum allowable EIS value) applicable to all sensitivity RoAoA per OSDD.  Declared for per RAT and E-UTRA supported channel BW for the OSDD (10.4).  The lowest EIS value for all the declared OSDD’s is called minSENS, while its related range of angles of arrival is called *minSENS RoAoA*.  NOTE 4: If the AAS BS is not capable of redirecting the receiver target related to the OSDD then there is only one RoAoA applicable to the OSDD. |
| D10.7 | Receiver target reference direction Sensitivity Range of Angle of Arrival | The sensitivity RoAoA associated with the receiver target reference direction (D10.9) for each OSDD. |
| D10.8 | Receiver target redirection range | For each OSDD the associated union of all the sensitivity RoAoA achievable through redirecting the receiver target related to the OSDD |
| D10.9 | Receiver target reference direction | For each OSDD an associated direction inside the receiver target redirection range (D10.8).  NOTE 5: For an OSDD without receiver target redirection range, this is a direction inside the sensitivity RoAoA. |
| D10.10 | Conformance test directions sensitivity RoAoA | For each OSDD that includes a receiver target redirection range, four sensitivity RoAoA comprising the conformance test directions (D10.11). |
| D10.11 | Conformance test directions | For each OSDD four conformance test directions.  If the OSDD includes a receiver target redirection range the following four directions shall be declared:  1) The direction determined by the maximum φ value achievable inside the receiver target redirection range, while θ value being the closest possible to the receiver target reference direction.  2) The direction determined by the minimum φ value achievable inside the receiver target redirection range, while θ value being the closest possible to the receiver target reference direction.  3) The direction determined by the maximum θ value achievable inside the receiver target redirection range, while φ value being the closest possible to the receiver target reference direction.  4) The direction determined by the minimum θ value achievable inside the receiver target redirection range, while φ value being the closest possible to the receiver target reference direction.  If an OSDD does not include a receiver target redirection range the following 4 directions shall be declared:  1) The direction determined by the maximum φ value achievable inside the sensitivity RoAoA, while θ value being the closest possible to the receiver target reference direction.  2) The direction determined by the minimum φ value achievable inside the sensitivity RoAoA, while θ value being the closest possible to the receiver target reference direction.  3) The direction determined by the maximum θ value achievable inside the sensitivity RoAoA, while φ value being the closest possible to the receiver target reference direction.  4) The direction determined by the minimum θ value achievable inside the sensitivity RoAoA, while φ value being the closest possible to the receiver target reference direction. |
| D10.12 | OTA sensitivity supported NR BS channel bandwidth and SCS | The NR BS channel bandwidths and SCS supported by each OSDD. |
| NOTE 1: If a BS is capable of 256QAM DL operation (and not 1024QAM DL operation) then two rated output power declarations may be made. One declaration is applicable when configured for 256QAM transmissions and the other declaration is applicable when not configured for 256QAM transmissions.  NOTE 2: If a BS is capable of 1024QAM DL operation then up to three rated output power declarations may be made. One declaration is applicable when configured for 1024QAM transmissions, a different declaration is applicable when configured for 256QAM transmissions and the other declaration is applicable when configured neither for 256 QAM nor 1024QAM transmissions. | | |

**Table 4.10-2: OTA AAS BS manufacturers declarations for radiated test requirements**

| **Declaration identifier** | **Declaration** | **Description** |
| --- | --- | --- |
| D11.1 | AAS BS requirements set | Declaration of either *hybrid AAS BS* architecture conforming to the *hybrid requirement set*, or OTA AAS BS architecture conforming to the *OTA requirement set*. |
| D11.2 | BS class | BS Class of the AAS BS, declared as Wide Area BS, Medium Range BS, or Local Area BS. |
| D11.3 | *OTA coverage range* | Declared as a single range within which selected TX OTA requirements are intended to be met.  NOTE 1: *OTA coverage range* is used for conformance testing of such TX OTA requirements as occupied bandwidth, frequency error, TAE or EVM. |
| D11.4 | *OTA coverage range* reference direction | The direction describing the reference direction of the *OTA converge range* (D11.2).  NOTE 2: The *OTA coverage reference* direction may be the same as the *Reference beam direction pai*r (D9.7) but does not have to be. |
| D11.5 | *OTA coverage range* maximum directions | The directions corresponding to the following points:  1) The direction determined by the maximum φ value achievable inside the OTA coverage range, while θ value being the closest possible to the OTA coverage range reference direction.  2) The direction determined by the minimum φ value achievable inside the *OTA coverage range*, while θ value being the closest possible to the *OTA coverage range* reference direction.  3) The direction determined by the maximum θ value achievable inside the *OTA coverage range*, while φ value being the closest possible to the *OTA coverage range* reference direction.  4) The direction determined by the minimum θ value achievable inside the *OTA coverage range*, while φ value being the closest possible to the *OTA coverage range* reference direction. |
| D11.6 | The rated carrier OTA BS power, Pmax,c,TRP | Pmax,c,TRP is declared as TRP OTA power per carrier, declared per supported operating band, per supported RAT. (Note 1, Note 2) |
| D11.7 | Worst-case side of the AAS BS on which the co-location test antenna is placed | Declare the worst-case side of the AAS BS on which the co-location test antenna is placed and test will be done only on the declared side. |
| D11.8 | Spurious emission category | Declare the OTA AAS BS spurious emission category as either category A or B with respect to the limits for spurious emissions, as defined in Recommendation ITU-R SM.329 [16]. |
| D11.9 | Geographic area support | The manufacturer shall declare the regions the OTA AAS BS may operate in. e.g. CEPT. |
| D11.10 | Band 20 or Band XX support, operating in geographical areas allocated to broadcasting (DTT) | If the OTA AAS BS supports Band 20/XX or Band 32/XXXII, the manufacturer shall declare if the OTA AAS BS may operate in geographical areas allocated to broadcasting (DTT). |
| D11.11 | Band 20 or Band XX support, emission level for channel N (PEM,N) | If the OTA AAS BS supports Band 20 or Band XX and has been declared to operate in geographical areas allocated to broadcasting (DTT; declaration D11.7), the emission level for channel N (as defined in annex G of 3GPP TS 36.104 [4]) shall be declared. |
| D11.12 | Band 20 or Band XX support, Maximum output power in 10 MHz (P10MHz) | If the OTA AAS BS supports Band 20 or Band XX and has been declared to operate in geographical areas allocated to broadcasting (DTT; declaration D11.7), the maximum output power in 10 MHz (annex G of 3GPP TS 36.104 [4]) shall be declared. |
| D11.13 | Band 32 or Band XXXII support, Declared emission level in Band 32/XXXII (PEM,B32,ind) | If the OTA AAS BS supports Band 32 or Band XXXII and has been declared to operate in geographical areas allocated to broadcasting (DTT; declaration D11.7), the emission level in Band 32/XXXII (PEM,B32,ind, ind = a, b, c, d, e) shall be declared. |
| D11.14 | Co-existence with other systems | The manufacturer shall declare whether the OTA AAS BS under test is intended to operate in geographic areas where one or more of the systems GSM850, GSM900, DCS1800, PCS1900, UTRA FDD, UTRA TDD, E-UTRA and/or PHS operating in another operating band are deployed. |
| D11.15 | Co-location with other base stations | The manufacturer shall declare whether the OTA AAS BS under test is intended to operate co-located with Base Stations of one or more of the systems GSM850, GSM900, DCS1800, PCS1900, UTRA FDD, UTRA TDD and/or E-UTRA operating in another operating band. |
| D11.16 | *Single-band RIB or multi-band RIB* | List of *single-band RIB and/or multi-band RIB* resulting from the supported operating bands (D9.4), and operating bands with multi-band dependencies (D9.16). |
| D11.17 | Single or multiple carrier | OTA AAS BS capability to operate with a single carrier (only) or multiple carriers. Declared per supported operating band, per RAT, per RIB. |
| D11.18 | Maximum number of supported carriers per band | Maximum number of supported carriers. Declared per supported operating band, per RAT, per RIB. |
| D11.19 | Total maximum number of supported carriers | Maximum number of supported carriers for all supported operating bands. Declared per RIB. |
| D11.20 | Other band combination multi-band restrictions | Declare any other limitation under simultaneous operation in the declared band combinations (D9.16), which have any impact on the test configuration generation. |
| D11.21 | Ncells | Number corresponding to the minimum number of cells that can be transmitted by an OTA AAS BS in a particular operating band. Declared per RIB (D11.13). |
| D11.22 | Maximum supported power difference between carriers | Maximum supported TRP difference between carriers in each supported operating band. Declared per RIB. |
| D11.23 | Maximum supported power difference between carriers is different operating bands | Maximum supported power difference between any two carriers in any two different supported operating bands. Declared per operating bands combination (D9.16, D11.16). |
| D11.24 | UTRA FDD MIMO support | Number of 'antennas' supported by the UTRA FDD MIMO mode (i.e. 2 or 4). Declared per supported UTRA FDD operating band (D9.4).  NOTE 3: The concept of "antenna 2", "antenna 3" and "antenna 4" is described in 3GPP TS 25.104 [2]. |
| D11.25 | UTRA Inner loop power control dynamic range | Power control dynamic range for UTRA inner loop power control. Declared per supported UTRA FDD operating band, per RIB. |
| D11.26 | Inter-band CA or inter-band HSDPA | Declaration of operating band combinations supporting inter-band CA or multi-band HSDPA. Declared per operating band combination (D9.16, D11.16). |
| D11.27 | Intra-band contiguous CA or intra-band contiguous HSDPA | Declaration of operating band(s) supporting intra-band contiguous CA, or intra‑band contiguous HSDPA. Declared per operating band with CA support. |
| D11.28 | Intra-band non-contiguous CA or intra-band contiguous HSDPA | Declaration of operating band(s) supporting intra-band non‑contiguous CA, or intra-band non-contiguous HSDPA. Declared per operating band with CA support. |
| D11.29 | OTA REFSENS RoAoA | The REFSENS RoAoA associated with the receiver target reference direction (D11.30). |
| D11.30 | OTA REFSENS receiver target reference direction | An associated direction inside the OTA REFSENS RoAoA (D11.29). |
| D11.31 | OTA REFSENS conformance test directions | Four conformance test directions for the OTA REFSENS:  1) The direction determined by the maximum φ value achievable inside the OTA REFSENS RoAoA, while θ value being the closest possible to the receiver target reference direction.  2) The direction determined by the minimum φ value achievable inside the OTA REFSENS RoAoA, while θ value being the closest possible to the receiver target reference direction.  3) The direction determined by the maximum θ value achievable inside the OTA REFSENS RoAoA, while φ value being the closest possible to the receiver target reference direction.  4) The direction determined by the minimum θ value achievable inside the OTA REFSENS RoAoA, while φ value being the closest possible to the receiver target reference direction. |
| D11.32 | Supported frequency range of the NR *operating band* | List of supported frequency ranges representing *fractional bandwidths* (FBW) of *operating bands* with FBW larger than 6%. |
| D11.33 | Rated beam EIRP at lower frequency range of the *fractional bandwidth* (Prated,c,FBWlow ) | The rated EIRP level per carrier at lower frequency range of the *fractional bandwidth* (Prated,c,FBWlow ), at the *beam peak direction* associated with a particular *beam direction pair* for each of the declared maximum steering directions (D9.9), as well as the reference *beam direction pair* (D9.7). (Note 1, Note 2)  Declared per beam for all supported frequency ranges (D11.32).  NOTE 13: if D11.33 is declared for certain frequency range (D11.32), there shall be no "Rated beam EIRP" declaration (D9.10) for the *operating band* containing that particular frequency range. |
| D11.34 | Rated beam EIRP at higher frequency range of the *fractional bandwidth* (Prated,c,FBWhigh ) | The rated EIRP level per carrier at higher frequency range of the *fractional bandwidth* (Prated,c,FBWhigh), at the *beam peak direction* associated with a particular *beam direction pair* for each of the declared maximum steering directions (D9.9), as well as the reference *beam direction pair* (D9.7). (Note 1, Note 2)  Declared per beam for all supported frequency ranges in (D11.32).  NOTE 14: if D11.34 is declared for certain frequency range (D11.32), there shall be no "Rated beam EIRP" declaration (D9.10) for the *operating band* containing that particular frequency range. |
| D11.35 | Rated transmitter TRP per RIB, Prated,t,TRP | Prated,t,TRP is declared as TRP OTA power per RIB, declared per supported operating band, per supported RAT. (Note 1, Note 2) |
| NOTE 1: If a BS is capable of 256QAM DL operation (and not 1024QAM DL operation) then two rated output power declarations may be made. One declaration is applicable when configured for 256QAM transmissions and the other declaration is applicable when not configured for 256QAM transmissions.  NOTE 2: If a BS is capable of 1024QAM DL operation then up to three rated output power declarations may be made. One declaration is applicable when configured for 1024QAM transmissions, a different declaration is applicable when configured for 256QAM transmissions and the other declaration is applicable when configured neither for 256 QAM nor 1024QAM transmissions. | | |

**<Next change>**

4.11.2 Test signal configurations

4.11.2.1 ATCR1: UTRA multicarrier operation

4.11.2.1.1 General

The purpose of ATCR1 is to test UTRA OTA multi-carrier aspects.

4.11.2.1.2 ATCR1a generation

ATCR1a should be constructed using the following method:

- The *Base Station RF Bandwidth* shall be the declared maximum radiated *Base Station RF Bandwidth* for contiguous operation (see table 4.10-1, D9.18).

- Place one UTRA FDD carrier adjacent to the upper *Base Station RF Bandwidth edge* and one UTRA FDD carrier adjacent to the lower *Base Station RF Bandwidth edge*. The specified FOffset shall apply.

- For transmitter tests, alternately place a UTRA FDD carrier adjacent to the already placed carriers at the low and high *Base Station RF Bandwidth edges* until there is no more space to fit a carrier or the beam does not support more carriers. The nominal carrier spacing defined in subclause 4.6 shall apply.

- The carrier(s) may be shifted maximum 100 kHz towards lower frequencies for BRFBW and MRFBW and towards higher frequencies for TRFBW to align with the channel raster.

4.11.2.1.3 ATCR1b generation

ATCR1b is constructed using the following method:

- The *Base Station RF Bandwidth* shall be the declared maximum radiated *Base Station RF Bandwidth* for contiguous operation (see table 4.10-1, D6.20).

- Place one UTRA TDD carrier adjacent to the upper *Base Station RF Bandwidth edge* and one UTRA TDD carrier adjacent to the lower *Base Station RF Bandwidth* edge. The specified FOffset shall apply.

- For transmitter tests, alternately place a UTRA TDD carrier adjacent to the already placed carriers at the low and high *Base Station RF Bandwidth edges* until there is no more space to fit a carrier or the beam does not support more carriers. The nominal carrier spacing defined in subclause 4.6 shall apply.

4.11.2.1.4 ATCR1 power allocation

Set the number of carriers to the number of carriers at maximum TRP (see table 4.10-1, D9.14).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

4.11.2.2 ANTCR1: UTRA FDD multicarrier non-contiguous operation

4.11.2.2.1 General

The purpose of ANTCR1 is to test UTRA FDD multicarrier non-contiguous aspects.

4.11.2.2.2 ANTCR1 generation

ANTCR1 is constructed as NTC1a in 3GPP TS 37.141 [13], subclause 4.8.1a.1

ANTCR1is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D6.21). The *Base* *Station RF Bandwidth* consists of one sub-block gap and two sub-blocks located at the edges of the declared maximum *Base Station RF Bandwidth* for non-contiguous operation.

- For transmitter tests, place one UTRA carrier adjacent to the upper *Base Station RF Bandwidth edge* and one UTRA carrier adjacent to the lower *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply.

- For receiver tests, place one UTRA carrier adjacent to the upper *Base Station RF Bandwidth edge* and one UTRA carrier adjacent to the lower *Base Station RF Bandwidth edge*. For single-band operation, if the maximum *Base Station RF Bandwidth* for non-contiguous operation is at least 35 MHz and the beam supports at least 4 UTRA FDD carriers, place a UTRA FDD carrier adjacent to each already placed carrier for each sub-block. The nominal carrier spacing defined in subclause 4.6 shall apply.

- The sub-block edges adjacent to the sub-block gap shall be determined using the specified FOffset-RAT for the carrier adjacent to the sub-block gap.

- The UTRA FDD carrier in the lower sub-block may be shifted maximum100 kHz towards lower frequencies and the UTRA FDD carrier in the upper sub-block may be shifted maximum100 kHz towards higher frequencies to align with the channel raster.

4.11.2.2.3 ANTCR1 power allocation

Set the number of carriers to the number of carriers at maximum TRP (see table 4.10-1, D9.14).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

4.11.2.3 ATCR2: E-UTRA multicarrier operation

4.11.2.3.1 General

The purpose of ATCR2a is to test E-UTRA multi-carrier aspects excluding CA occupied bandwidth.

The purpose of ATCR2b is to test E-UTRA Contiguous CA occupied bandwidth.

4.11.2.3.2 ATCR2a generation

ATCR2a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* for contiguous operation (see table 4.10-1, D9.18).

- Select the narrowest supported E-UTRA carrier and place it adjacent to the low *Base Station RF Bandwidth edge*. Place a 5 MHz E-UTRA carrier adjacent to the high *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply.

- For transmitter tests, select as many 5 MHz E-UTRA carriers that the beam supports and that fit in the rest of the *Base Station RF Bandwidth*. Place the carriers adjacent to each other starting from the high *Base Station RF Bandwidth edge*. The nominal carrier spacing defined in subclause 4.6 shall apply. The specified FOffset-RAT shall apply.

- If 5 MHz E-UTRA carriers are not supported by the beam the narrowest supported *channel bandwidth* (see table 4.10-1, D9.6) shall be selected instead.

The test configuration should be constructed on a per band basis for all component carriers of the inter-band CA bands declared to be supported by the beam(see table 4.10-1, D9.20). All configured component carriers are transmitted simultaneously in the tests where the transmitter should be on.

4.11.2.3.3 ATCR2b generation

ATCR2b is constructed on a per band basis using the following method:

- All component carrier combinations supported by the beam, which have different sum of *channel bandwidth* of component carrier, shall be tested. For all component carrier combinations which have the same sum of *channel bandwidth* of component carriers, only one of the component carrier combinations shall be tested.

- Of all component carrier combinations which have same sum of *channel bandwidth* of component carrier, select those with the narrowest carrier at the lower *Base Station RF Bandwidth edge*.

- Of the combinations selected in the previous step, select one with the narrowest carrier at the upper *Base Station RF Bandwidth edge*.

- If there are multiple combinations fulfilling previous steps, select the one with the smallest number of component carrier.

- If there are multiple combinations fulfilling previous steps, select the one with the widest carrier being adjacent to the lowest carrier.

- If there are multiple combinations fulfilling previous steps, select the one with the widest carrier being adjacent to the highest carrier

- If there are multiple combinations fulfilling previous steps, select the one with the widest carrier being adjacent to the carrier which has been selected in the previous step.

- If there are multiple combinations fulfilling previous steps, repeat the previous step until there is only one combination left.

- The nominal carrier spacing defined in subclause 4.6 shall apply.

4.11.2.3.4 ATCR2 power allocation

Set the number of carriers to the number of carriers at maximum TRP (see table 4.10-1, D9.14).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

For a beamdeclared to support only CA operation (see table 4.10-1, D6.23), set the power spectral density of each carrier to the same level so that the sum of the carrier power equals the same value as above.

4.11.2.4 ANTCR2: E-UTRA multicarrier non-contiguous operation

4.11.2.4.1 General

The purpose of ANTCR2 is to test E-UTRA multicarrier non-contiguous aspects.

4.11.2.4.2 ANTCR2 generation

ANTCR2 is constructed as NTC2 in 3GPP TS 37.141 [13], subclause 4.8.2a.1

ANTCR2 is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D9.19). The *Base Station RF Bandwidth* consists of one sub-block gap and two sub-blocks located at the edges of the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1, D9.17).

- For transmitter tests, place a 5MHz E-UTRA carrier adjacent to the upper *Base Station RF Bandwidth edge* and a 5MHz E-UTRA carrier adjacent to the lower *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply. If 5 MHz E-UTRA carriers are not supported by the beam, the narrowest supported *channel bandwidth* shall be selected instead.

- For receiver tests, place a 5MHz E-UTRA carrier adjacent to the upper *Base Station RF Bandwidth edge* and a 5MHz E-UTRA carrier adjacent to the lower *Base Station RF Bandwidth edge*. If 5 MHz E-UTRA carriers are not supported by the beam, the narrowest supported *channel bandwidth* shall be selected instead.

- For single-band operation receiver tests, if the remaining gap is at least 15 MHz plus two times the *channel bandwidth* used in the previous step and the beam supports at least 4 E-UTRA carriers, place an E-UTRA carrier of this *channel bandwidth* adjacent to each already placed carrier for each sub-block. The nominal carrier spacing defined in subclause 4.5 shall apply.

- The sub-block edges adjacent to the sub-block gap shall be determined using the specified FOffset-RAT for the carrier adjacent to the sub-block gap.

4.11.2.4.3 ANTCR2 power allocation

Set the number of carriers to the number of carriers at maximum EIRP (see table 4.10-1, D9.14).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

4.11.2.5 ATCR3: UTRA and E-UTRA multi RAT operation

4.11.2.5.1 General

The purpose of ATCR3 is to test UTRA and E-UTRA multi-RAT aspects.

If the maximum EIRP and total number of supported carriers at maximum EIRP are not simultaneously supported in Multi-RAT operations, two instances of ATCR3 shall be generated using the following values for rated transmitter TRP and the total number of supported carriers:

1) The maximum EIRP and the reduced number of supported carriers at the maximum EIRP in Multi-RAT operations.

2) The reduced maximum EIRP at the total number of supported carriers in Multi-RAT operations and the total number of supported carriers.

Tests that use ATCR3 shall be performed using both instances 1) and 2) of ATCR3.

4.11.2.5.2 ATCR3a generation

ATCR3a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1 D9.17).

- Select an FDD UTRA carrier to be placed at the lower *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply. The UTRA FDD may be shifted maximum 100 kHz towards lower frequencies to align with the channel raster.

- Place a 5 MHz E-UTRA carrier at the upper *Base Station RF Bandwidth edge*. If that is not possible use the narrowest E-UTRA carrier supported by the beam. The specified FOffset-RAT shall apply.

- For transmitter tests, alternately add FDD UTRA carriers at the low end and 5 MHz E-UTRA carriers at the high end adjacent to the already placed carriers until the *Base Station RF Bandwidth* is filled or the total number of supported carriers (see table 4.10-1, D9.14) is reached. The nominal carrier spacing defined in subclause 4.6 shall apply.

4.11.2.5.3 ATCR3b generation

ATCR3b is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1 D9.17).

- Select a UTRA TDD carrier to be placed at the lower *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply.

- Place a 5 MHz E-UTRA carrier at the upper *Base Station RF Bandwidth edge*. If that is not possible use the narrowest E-UTRA carrier supported by the beam. The specified FOffset-RAT shall apply.

- For transmitter tests, alternately add UTRA TDD carriers at the low end and 5 MHz E-UTRA carriers at the high end adjacent to the already placed carriers until the *Base Station RF Bandwidth* is filled or the total number of supported carriers is reached. The nominal carrier spacing defined in clause 4.6 shall apply.

4.11.2.5.4 ATCR3 power allocation

For ATCR3a set the number of carriers to the reduced number of carriers at maximum TRP in multi-RAT operations (see table 4.10-1, D9.23) and set each carrier to maximum EIRP (see table 4.10-1, D9.11).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

4.11.2.6 ANTCR3: UTRA and E-UTRA multi RAT non-contiguous operation

4.11.2.6.1 General

The purpose of ANTCR3 is to test UTRA and E-UTRA multi RAT non-contiguous aspects.

If the maximum EIRP and total number of supported carriers at maximum EIRP are not simultaneously supported in Multi-RAT operations, two instances of ANTCR3 shall be generated using the following values for rated transmitter TRP and the total number of supported carriers:

1) The maximum EIRP and the reduced number of supported carriers at the maximum EIRP in Multi-RAT operations.

2) The reduced maximum EIRP at the total number of supported carriers in Multi-RAT operations and the total number of supported carriers.

If the reduced number of supported carriers is 4 or more, only instance 1) of ANTCR3 shall be used in the tests, otherwise both instances 1) and 2) of ANTCR3 shall be used in the tests.

4.11.2.6.2 ANTCR3a generation

ANTCR3a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D6.21). The *Base Station RF Bandwidth* consists of one sub-block gap and two sub-blocks located at the edges of the declared maximum *Base Station RF Bandwidth* for non-contiguous operation.

- For transmitter tests, place an UTRA carrier at the lower *Base Station RF Bandwidth edge* and a 5 MHz E-UTRA carrier at the upper *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply. If 5 MHz E-UTRA carriers are not supported by the beam, the narrowest supported *channel bandwidth* shall be selected instead. The UTRA FDD may be shifted maximum 100 kHz towards lower frequencies to align with the channel raster.

- For receiver tests, place an UTRA carrier at the lower *Base Station RF Bandwidth edge* and a 5 MHz E-UTRA carrier at the upper *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply. If 5 MHz E-UTRA carriers are not supported by the beam, the narrowest supported *channel bandwidth* shall be selected instead. The UTRA FDD may be shifted maximum 100 kHz towards lower frequencies to align with the channel raster.

- For single-band operation receiver tests, if the remaining gap is at least 20 MHz plus the *channel bandwidth* of the E-UTRA carrier used in the previous step and the beam supports at least 2 UTRA and 2 E-UTRA carriers, place a E-UTRA carrier of this *channel bandwidth* adjacent to the carrier at the lower *Base Station RF Bandwidth edge* and UTRA carrier adjacent to the carrier at the upper *Base Station RF Bandwidth edge*. The nominal carrier spacing defined in subclause 4.6 shall apply. The UTRA FDD may be shifted maximum 100 kHz towards higher frequencies to align with the channel raster.

- The sub-block edges adjacent to the sub-block gap shall be determined using the specified FOffset-RAT for the carrier adjacent to the sub-block gap.

4.11.2.6.3 ANTCR3 power allocation

For case (1) in subclause 4.11.2.6.1 set the number of carriers to the reduced number of carriers at maximum TRP in multi-RAT operations (see table 4.10-1, D9.23).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

For case (2) in subclause 4.11.2.6.1 set the number of carriers to the reduced number of carriers at maximum TRP (see table 4.10-1, D9.14) and set each carrier to the reduced maximum TRP at the total number of supported carriers in Multi-RAT operations (see table 4.10-1, D9.24) for the tested *beam direction pair*.

4.11.2.7 ATCR4: Single carrier for receiver tests

4.11.2.7.1 ATCR4a generation

ATCR4a is constructed using the following method:

- Place a single (UTRA FDD) carrier in the middle of the maximum radiated *Base Station RF Bandwidth*. The carrier may be shifted maximum 100 kHz towards lower frequencies for BRFBW and MRFBW and towards higher frequencies for TRFBW to align with the channel raster.

4.11.2.7.2 ATCR4b generation

ATCR4b is constructed using the following method:

- Place the narrowest supported E-UTRA carrier in the middle of the maximum radiated *Base Station RF Bandwidth*.

4.11.2.7.3 ATCR4c generation

ATCR4c is constructed using the following method:

- Place a single UTRA TDD carrier in the middle of the maximum radiated *Base Station RF Bandwidth*.

4.11.2.7.3A ATCR4d generation

ATCR4d is constructed using the following method:

- Place a single NR carrier as specified in subclause 4.11.1A in the middle of the maximum radiated *Base Station RF Bandwidth*.

11.2.7.4 ATCR4 power allocation

Set the beam EIRP on the carrier such that it's EIRP level is equal to the sum of *rated beam EIRPs* (see table 4.10-1, D9.12) when transmitting the maximum supported carriers at the *beam peak direction* (see table 4.10-1, D9.16).

4.11.2.8 Generation of MB-MSR test configurations

4.11.2.8.1 ATCR5a: MB-MSR test configuration for full carrier allocation

4.11.2.8.1.1 General

The purpose of ATCR5a is to test beams which have been generated using transceiver units supporting operation in multiple operating bands through common active electronic components(s), considering maximum supported number of carriers.

4.11.2.8.1.2 ATCR5a generation

ATCR5a is based on re-using the existing test configurations applicable per band on beams generated using Multi-band transceiver units and hence have declared multi-band dependencies (see table 4.10-1, D9.16). ATCR5a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1, D9.17).

- The number of carriers of each supported operating band shall be the declared maximum number of supported carriers by the multi-band dependencies in each band (see table 4.10-1, D9.16).Carriers shall first be placed at the outermost edges of the declared maximum radiated *Radio Bandwidth* (see table 4.10-1, D9.17). Additional carriers shall next be placed at the edges of the *Base Station RF Bandwidths,* if possible.

- The allocated *Base Station RF Bandwidth* of the outermost bands shall be located at the outermost edges of the declared maximum radiated *Radio Bandwidth* (see table 4.10-1, D9.17).

- Each concerned band shall be considered as an independent band and the corresponding test configuration shall be generated in each band. The mirror image of the single band test configuration shall be used in the highest band being tested for the beam.

- Band category and declared per band capability set (see table 4.10-1, D9.25) shall be used to generate per band RAT/carrier allocation according to table 4.11.2.8.1.2-1 for each band category and radiated capability set. If an operating band with multi-band dependencies supports three carriers only, two carriers shall be placed in one band according to the relevant test configuration while the remaining carrier shall be placed at the edge of the maximum *Radio Bandwidth* (DUID9) in the other band.

- If the sum of the maximum *Base Station RF bandwidths* of each of the supported operating bands is greater than the declared *Total RF Bandwidth* BWtot (D9.32) of transmitter and receiver for the declared band combinations of the BS, then repeat the steps above for test configurations where the *Base Station RF Bandwidth* of one of the operating band shall be reduced so that the declared *Total RF Bandwidth* is not exceeded and vice versa.

- If the sum of the maximum number of supported carrier of each supported operating bands with multi-band dependencies (see table 4.10-1, D9.16) is larger than the declared t Total number of supported carriers for operating bands with multi-band dependencies (see table 4.10-1, D9.27), repeat the steps above for test configurations where in each test configuration the number of carriers of one of the operating band shall be reduced so that the total number of supported carriers is not be exceeded and vice versa.

**Table 4.11.2.8.1.2-1: The applicability of test configuration in each band**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **BC** | **RCSA 1** | **RCSA 2** | **RCSA 3** | **RCSA 3A** | **RCSA 4** | **RCSA 5** |
| BC1 | ATCR1a | ATCR2a | ATCR3a | ATCR7 | ATCR1a | ATCR2a |
| BC2 | ATCR1a | ATCR2a | ATCR3a | ATCR7 | ATCR1a | ATCR2a |
| BC3 | ATCR1b | ATCR2a | ATCR3b | ATCR7 | ATCR1b | ATCR2a |

4.11.2.8.1.3 ATCR5a power allocation

Set the number of carriers to the total number of supported carriers for the declared multi-band dependencies (see table 4.10-1, D9.27).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

If the allocated number of carriers in an operating band exceeds the declared number of carriers at maximum TRP in an operating band (see table 4.10-1, D9.14) the carriers should if possible be allocated to a different operating band.

4.11.2.8.2 ATCR5b: MB-MSR test configuration with high PSD per carrier

4.11.2.8.2.1 General

The purpose of ATCR5b is to test multi-band operation aspects considering higher PSD cases with reduced number of carriers and non-contiguous operation (if supported) in multi-band mode.

4.11.2.8.2.2 ATCR5b generation

ATCR5b is based on re-using the existing test configurations applicable for operating bands using multi-band transceiver units and hence have declared multi-band dependencies (see table 4.10-1, D9.16)*.* ATCR5b is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1, D9.17).

- The allocated *Radio Bandwidth* of the outermost bands shall be located at the outermost edges of the declared maximum *Radio Bandwidth* of the operating band with multi-band dependencies (see table 4.10-1, D9.26).

- The maximum number of carriers is limited to two per band. Carriers shall be placed at the outermost edges of the declared maximum *Radio Bandwidth* of the operating band with multi-band dependencies (see table 4.10-1, D9.26).

- Each concerned band shall be considered as an independent band and the corresponding test configuration for non-contiguous operation shall be generated in each band according to table 4.11.2.8.2.2-1. Narrowest supported E-UTRA *channel bandwidth* shall be used in the test configuration. The mirror image of the single band test configuration shall be used in the highest band being tested*.*

- For AAS BS supporting CSA4 in the band and supports three carriers only, two carriers shall be placed in one band according to AUTC2 while the remaining carrier shall be placed at the edge of the Maximum *Base Station RF Bandwidth* in the other band.

- If the sum of the maximum *Base Station RF bandwidths* of each of the supported operating bands is greater than the declared *Total RF Bandwidth* BWtot (D9.32) of transmitter and receiver for the declared band combinations of the BS, then repeat the steps above for test configurations where the *Base Station RF Bandwidth* of one of the operating band shall be reduced so that the declared *Total RF Bandwidth* of the operating band with multi-band dependencies (see table 4.10-1, D9.26) is not exceeded and vice versa.

**Table 4.11.2.8.2.2-1: The applicability of test configuration in each band**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **BC** | **RCSA 1** | **RCSA 2** | **RCSA 3** | **RCSA 3A** | **RCSA 4** | **RCSA 5** |
| BC1 | ANTCR1a | ANTCR2 | ANTCR3a | ANTCR7 | ANTCR1 | ANTCR2 |
| BC2 | ANTCR1a | ANTCR2 | ANTCR3a | ANTCR7 | ANTCR1 | ANTCR2 |
| BC3 | ATCR1b | ANTCR2 | ANTCR3a | ANTCR7 | N/A | ANTCR2 |

4.11.2.8.2.3 ATCR5b power allocation

Set the number of carriers to the total number of supported carriers for the declared multi-band dependencies (see table 4.10-1, D9.27).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

If the sum of the TRP for all carriers in an operating band(s) exceeds the sum of the maximum TRP per carrier (see table 4.10-1, D9.14) for the number of carriers transmitted in multi-band operation, the exceeded part shall, if possible, be reallocated into the other band(s). If the TRP allocated for a carrier exceeds the declared maximum TRP, the exceeded power shall, if possible, be reallocated into the other carriers.

4.11.2.9 ATCR6: Single carrier for Transmitter tests

4.11.2.9.1 ATCR6a generation

ATCR6a is constructed using the following method:

- Place a single UTRA carrier at the RF channel to be tested.

4.11.2.9.2 ATCR6b generation

ATCR6b is constructed using the following method:

- Place a 5 MHz E-UTRA carrier i at the RF channel to be tested. If 5 MHz carriers are not supported by the beam the narrowest supported channel BW shall be selected instead.

4.11.2.9.3 Void

4.11.2.9.3A ATCR6d generation

ATCR6d is constructed using the following method:

- Place a single NR carrier as specified in subclause 4.11.1A at the RF channel to be tested.

4.11.2.9.4 ATCR6 power allocation

Set the number of carriers to 1. Set the beam parameters to those appropriate for the beam identifier of the beam under test and to the direction to be tested from the beam declarations (see table 4.10-1, D9.3 - 13).

4.11.2.10 ATCR7: E-UTRA and NR multi RAT operation

4.11.2.10.1 General

The purpose of ATCR7 is to test E-UTRA and NR multi-RAT aspects.

If the maximum EIRP and total number of supported carriers at maximum EIRP are not simultaneously supported in Multi-RAT operations, two instances of ATCR7 shall be generated using the following values for rated transmitter TRP and the total number of supported carriers:

1) The maximum EIRP and the reduced number of supported carriers at the maximum EIRP in Multi-RAT operations.

2) The reduced maximum EIRP at the total number of supported carriers in Multi-RAT operations and the total number of supported carriers.

Tests that use ATCR7 shall be performed using both instances 1) and 2) of ATCR7.

4.11.2.10.2 ATCR7 generation

ATCR7 is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1 D9.17).

- Select a NR carrier as specified in subclause 4.11.1A to be placed at the lower *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply.

- Place a 5 MHz E-UTRA carrier at the upper *Base Station RF Bandwidth edge*. If that is not possible use the narrowest E-UTRA carrier supported by the beam. The specified FOffset-RAT shall apply.

- For transmitter tests, alternately add NR carriers as specified in subclause 4.11.1A at the low end and 5 MHz E-UTRA carriers at the high end adjacent to the already placed carriers until the *Base Station RF Bandwidth* is filled or the total number of supported carriers (see table 4.10-1, D9.14) is reached. The nominal carrier spacing defined in subclause 4.6 shall apply.

4.11.2.10.3 ATCR7 power allocation

Set the number of carriers to the reduced number of carriers at maximum TRP in multi-RAT operations (see table 4.10-1, D9.23) and set each carrier to maximum EIRP (see table 4.10-1, D9.11).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

4.11.2.11 ANTCR7: E-UTRA and NR multi RAT non-contiguous operation

4.11.2.11.1 General

The purpose of ANTCR7 is to test E-UTRA and NR multi RAT non-contiguous aspects.

If the maximum EIRP and total number of supported carriers at maximum EIRP are not simultaneously supported in Multi-RAT operations, two instances of ANTCR7 shall be generated using the following values for rated transmitter TRP and the total number of supported carriers:

1) The maximum EIRP and the reduced number of supported carriers at the maximum EIRP in Multi-RAT operations.

2) The reduced maximum EIRP at the total number of supported carriers in Multi-RAT operations and the total number of supported carriers.

If the reduced number of supported carriers is 4 or more, only instance 1) of ANTCR7 shall be used in the tests, otherwise both instances 1) and 2) of ANTCR7 shall be used in the tests.

4.11.2.11.2 ANTCR7 generation

ANTRC7 is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D6.21). The *Base Station RF Bandwidth* consists of one sub-block gap and two sub-blocks located at the edges of the declared maximum *Base Station RF Bandwidth* for non-contiguous operation.

- For transmitter tests, place an NR carrier as specified in subclause 4.11.1A at the lower *Base Station RF Bandwidth edge* and a 5 MHz E-UTRA carrier at the upper *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply. If 5 MHz E-UTRA carriers are not supported by the beam, the narrowest supported *channel bandwidth* shall be selected instead.

- For receiver tests, place a NR carrier as specified in subclause 4.11.1A at the lower *Base Station RF Bandwidth edge* and a 5 MHz E-UTRA carrier at the upper *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply. If 5 MHz E-UTRA carriers are not supported by the beam, the narrowest supported *channel bandwidth* shall be selected instead.

- The sub-block edges adjacent to the sub-block gap shall be determined using the specified FOffset-RAT for the carrier adjacent to the sub-block gap.

4.11.2.11.3 ANTCR7 power allocation

For case (1) in subclause 4.11.2.6.1 set the number of carriers to the reduced number of carriers at maximum TRP in multi-RAT operations (see table 4.10-1, D9.23).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

For case (2) in subclause 4.11.2.6.1 set the number of carriers to the reduced number of carriers at maximum TRP (see table 4.10-1, D9.14) and set each carrier to the reduced maximum TRP at the total number of supported carriers in Multi-RAT operations (see table 4.10-1, D9.24) for the tested *beam direction pair*.

4.11.12.3 ATCR8: NR multicarrier operation

4.11.2.12.1 General

The purpose of ATCR8a is to test NR multi-carrier aspects excluding CA occupied bandwidth.

The purpose of ATCR8b is to test NR Contiguous CA occupied bandwidth.

4.11.2.12.2 ATCR8a generation

ATCR8 is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared radiated *Base Station RF Bandwidth* for contiguous operation (see table 4.10-1, D9.18).

- Select the NR carrier as specified in subclause 4.11.1A and place it adjacent to the low *Base Station RF Bandwidth edge*. Place a similar NR carrier adjacent to the high *Base Station RF Bandwidth edge*. The specified FOffset‑RAT shall apply.

- For transmitter tests, select as many similar NR carriers that the beamsupports and that fit in the rest of the *Base Station RF Bandwidth*. Place the carriers adjacent to each other starting from the highBase Station RF Bandwidth *edge*. The nominal carrier spacing defined in subclause 4.6 shall apply. The specified FOffset-RAT shall apply.

The test configuration should be constructed on a per band basis for all component carriers of the inter-band CA bands declared to be supported by the beam(see table 4.10-1, D9.20). All configured component carriers are transmitted simultaneously in the tests where the transmitter should be on.

4.11.2.3.3 ATCR8b generation

ATCR8b is constructed on a per band basis using the following method:

- All component carrier combinations supported by the beam, which have different sum of *channel bandwidth* of component carrier, shall be tested. For all component carrier combinations which have the same sum of *channel bandwidth* of component carriers, only one of the component carrier combinations shall be tested.

- Of all component carrier combinations which have same sum of *channel bandwidth* of component carrier, select those with the narrowest carrier at the lower *Base Station RF Bandwidth edge*.

- Of the combinations selected in the previous step, select one with the narrowest carrier at the upper *Base Station RF Bandwidth edge*.

- If there are multiple combinations fulfilling previous steps, select the one with the smallest number of component carrier.

- If there are multiple combinations fulfilling previous steps, select the one with the widest carrier being adjacent to the lowest carrier.

- If there are multiple combinations fulfilling previous steps, select the one with the widest carrier being adjacent to the highest carrier

- If there are multiple combinations fulfilling previous steps, select the one with the widest carrier being adjacent to the carrier which has been selected in the previous step.

- If there are multiple combinations fulfilling previous steps, repeat the previous step until there is only one combination left.

- The nominal carrier spacing defined in subclause 4.6 shall apply.

4.11.2.12.4 ATCR8 power allocation

Set the number of carriers to the number of carriers at maximum TRP (see table 4.10-1, D9.14).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

For a beamdeclared to support only CA operation (see table 4.10-1, D6.23), set the power spectral density of of each carrier to the same level so that the sum of the carrier power equals the same value as above.

4.11.2.13 ANTCR8: NR multicarrier non-contiguous operation

4.11.2.13.1 General

The purpose of ANTCR8 is to test NR multicarrier non-contiguous aspects.

4.11.2.13.2 ANTCR8 generation

ANTCR8 is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum radiated *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D9.19). The *Base Station RF Bandwidth* consists of one sub-block gap and two sub-blocks located at the edges of the declared maximum radiated *Base Station RF Bandwidth* (see table 4.10-1, D9.17).

- For transmitter tests, place a NR carrier as specified in subclause 4.11.1A adjacent to the upper *Base Station RF Bandwidth edge* and a similar NR carrier adjacent to the lower *Base Station RF Bandwidth edge*. The specified FOffset-RAT shall apply.

- For receiver tests, place a NR carrier as specified in subclause 4.11.1A adjacent to the upper *Base Station RF Bandwidth edge* and a similar NR carrier adjacent to the lower *Base Station RF Bandwidth edge*. - The sub-block edges adjacent to the *sub-block gap* shall be determined using the specified FOffset-RAT for the carrier adjacent to the *sub-block gap*.

4.11.2.13.3 ANTCR8 power allocation

Set the number of carriers to the number of carriers at maximum EIRP (see table 4.10-1, D9.14).

For EIRP accuracy requirements set each beam to maximum EIRP (see table 4.10-1, D9.10) for the tested *beam direction pair*.

For all other requirements set the power of each carrier to the same level so that the sum of the carrier powers equals to Rated transmitter TRP per RIB, Prated,t,TRP (see table 4.10-2, D11.35).

**<End of change>**