**3GPP TSG-RAN4 Meeting #97-e *draft R4-2017589***

**Online, , 2nd Nov 2020 - 13th Nov 2020**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **37.145-1** | **CR** | **0221** | **rev** | **1** | **Current version:** | **13.10.0** |  |
|  | | | | | | | | |
| *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 37.145-1: correction of manufacturer's declarations for test signal configurations, Rel-13 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | AAS\_BS\_LTE\_UTRA-Perf, TEI13 | | | | |  | ***Date:*** | | | 2020-10-23 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-13 |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | It was observed that there are still undefined terms "DUID" and “AUTC” mistakenly used instead of proper manufacturer's declaration and test signal confugration numbers in the test signal configuration sections.  Furthermore, related ATC2/ANTC2 as well as ATC3/ANTC3 text was aligned for consistency purposes. | | | | | | | | |
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| ***Summary of change:*** | | * 4.11.2.2.2: ANTC1 test signal configuration name corrected * 4.11.2.3.4, 4.11.2.4.3, 4.11.2.5.1: details added on the referred manufacturer declaration. * 4.11.2.4.2: repeated text removed. * 4.11.2.5.1: power terminology corrected * 4.11.2.6.1, 4.11.2.8.1.2: incorrect DUID terms corrected * 4.11.2.8.2.2: mistaken term AUTCs corrected   Other editorial corrections. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Mistaken test signal configuration terms would be used. Undefined terms would be used in the specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.11.2.2.2, 4.11.2.3.4, 4.11.2.4.3, 4.11.2.5.1, 4.11.2.4.2, 4.11.2.6.1, 4.11.2.8.1.2, 4.11.2.8.2.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **x** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*------------------------------ Modified section ------------------------------*

#### 4.11.2.2 ANTC1: UTRA FDD multicarrier non-contiguous operation

##### 4.11.2.2.1 General

The purpose of ANTC1 is to test UTRA FDD multicarrier non-contiguous aspects.

##### 4.11.2.2.2 ANTC1 generation

The purpose of ANTC1a is to test UTRA multicarrier non-contiguous aspects. ANTC1 is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D6.19) of the *TAB connector*. The *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 *TAB connector* 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 maximum 100 kHz towards lower frequencies and the UTRA FDD carrier in the upper sub-block may be shifted maximum 100 kHz towards higher frequencies to align with the channel raster.

*------------------------------ Next modified section ------------------------------*

#### 4.11.2.3 ATC2: E-UTRA multicarrier operation

##### 4.11.2.3.1 General

The purpose of ATC2a is to test E-UTRA multi-carrier aspects excluding CA occupied bandwidth.

The purpose of ATC2b is to test E-UTRA contiguous CA occupied bandwidth.

##### 4.11.2.3.2 ATC2a generation

ATC2a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* for contiguous operation (see table 4.10-1, D6.18) of the *TAB connector*.

- 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 *TAB connector* 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 *TAB connector* the narrowest supported *channel bandwidth* 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 *TAB connector* (see table 4.10-1, D6.29). All configured component carriers are transmitted simultaneously in the tests where the transmitter should be on.

##### 4.11.2.3.3 ATC2b generation

ATC2b is constructed on a per band basis using the following method:

- All component carrier combinations supported by the *TAB connector*, 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 ATC2 power allocation

Set the power of each carrier to the same power so that the sum of the carrier powers equals Prated,RAT,TABC for E-UTRA (see table 4.10-1, D6.33).

For a *TAB connector* declared to support only CA operation (see table 4.10-1, D6.22), set the power spectral density of each carrier to the same level so that the sum of the carrier powers equals the rated total output power PRated,t,TABC (see table 4.10-1, D6.34).

*------------------------------ Next modified section ------------------------------*

#### 4.11.2.4 ANTC2: E-UTRA multicarrier non-contiguous operation

##### 4.11.2.4.1 General

The purpose of ANTC2 is to test E-UTRA multi-carrier non-contiguous aspects.

##### 4.11.2.4.2 ANTC2 generation

ANTC2 is constructed as NTC2 in 3GPP TS 37.141 [16] subclause 4.8.2a.1.

ANTC2 is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D6.19) of the *TAB connector*. 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* (see table 4.10-1, D.17).

- For transmitter tests, place a 5 MHz E-UTRA carrier adjacent to the upper *Base Station RF Bandwidth edge* and a 5 MHz 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 *TAB connector*, the narrowest supported *channel bandwidth* shall be selected instead.

- For receiver tests, place a 5 MHz E-UTRA carrier adjacent to the upper *Base Station RF Bandwidth edge* and a 5 MHz E-UTRA carrier adjacent to the lower *Base Station RF Bandwidth edge*. If 5 MHz E-UTRA carriers are not supported by the *TAB connector*, 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 *TAB connector* supports at least 4 E-UTRA carriers, place a E‑UTRA carrier of this *channel bandwidth* adjacent to each already placed carrier for each sub-block. The nominal carrier spacing defined in subclause 4.6 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*.

##### 4.11.2.4.3 ANTC2 power allocation

Set the power of each carrier to the same power so that the sum of the carrier powers equals Prated,RAT,TABC for E-UTRA (see table 4.10-1, D6.33).

*------------------------------ Next modified section ------------------------------*

#### 4.11.2.5 ATC3: UTRA and E-UTRA multi-RAT operation

##### 4.11.2.5.1 General

The purpose of ATC3 is to test UTRA and E-UTRA multi-RAT aspects.

If the rated total output power per *TAB connector* PRated,t,TABC (see table 4.10-1, D.34) and total number of supported carriers (see table 4.10-1, D.25) are not simultaneously supported in multi-RAT operations, two instances of ATC3 shall be generated using the following values for rated total output power and the total number of supported carriers:

1) The rated total output power *per TAB connector* PRated,t,TABC (see table 4.10-1, D6.34) and the reduced number of supported carriers at the rated total output power in multi-RAT operations (see table 4.10-1, D6.26).

2) The reduced total output power at the total number of supported carriers in multi-RAT operations (see table 4.10-1, D6.27) and the total number of supported carriers (see table 4.10-1, D6.25).

Tests that use ATC3 shall be performed using both instances 1) and 2) of ATC3.

##### 4.11.2.5.2 ATC3a generation

ATC3a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* (see table 4.10-1, D6.17) of the *TAB connector*.

- 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 *TAB connector*. 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, D6.25) is reached. The nominal carrier spacing defined in subclause 4.6 shall apply.

##### 4.11.2.5.3 ATC3b generation

ATC3b is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* (see table 4.10-1, D6.17) of the *TAB connector*.

- 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 *TAB connector*. 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 (see table 4.10-1, D6.25) is reached. The nominal carrier spacing defined in clause 4.6 shall apply.

*------------------------------ Unchanged part omitted ------------------------------*

*------------------------------ Next modified section ------------------------------*

#### 4.11.2.6 ANTC3: UTRA and E-UTRA multi RAT non-contiguous operation

##### 4.11.2.6.1 General

The purpose of ANTC3 is to test UTRA and E-UTRA multi-RAT non-contiguous aspects.

If the rated total output power per *TAB connector* PRated,t,TABC (see table 4.10-1, D.34)and total number of supported carriers (see table 4.10-1, D.25) are not simultaneously supported in multi-RAT operations, two instances of ANTC3 shall be generated using the following values for PRated,t,TABC and the total number of supported carriers:

1) The rated total output power *per TAB connector* PRated,t,TABC (see table 4.10-1, D6.34)and the reduced number of supported carriers at the rated total output power in multi-RAT operations (see table 4.10-1, D6.26).

2) The reduced total output power at the total number of supported carriers in multi-RAT operations (see table 4.10-1, D6.27) at the total number of supported carriers (see table 4.10-1, D6.25).

If the reduced number of supported carriers is 4 or more, only instance 1) of ANTC3 shall be used in the tests, otherwise both instances 1) and 2) of ANTC3 shall be used in the tests.

##### 4.11.2.6.2 ANTC3a generation

ANTC3a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* for non-contiguous operation (see table 4.10-1, D6.19) of the *TAB connector*. 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 (see table 4.10-1, D6.19).

- 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 *TAB connector*, 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 *TAB connector*, 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 *TAB connector* 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*.

*------------------------------ Unchanged part omitted ------------------------------*

*------------------------------ Next modified section ------------------------------*

##### 4.11.2.8.1 ATC5a: MB-MSR test configuration for full carrier allocation

4.11.2.8.1.1 General

The purpose of ATC5a is to test *multi-band TAB connectors*, considering maximum supported number of carriers.

4.11.2.8.1.2 ATC5a generation

ATC5a is based on re-using the existing test configurations applicable per band on *multi-band TAB connectors.* ATC5a is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* (see table 4.10-1, D6.17) of the *multi-band TAB connector.*

- The number of carriers of each supported operating band shall be the declared maximum number of supported carriers by the *multi-band TAB connector* in each band (see table 4.10-1, D6.25)*.* Carriers shall first be placed at the outermost edges of the declared maximum *Radio Bandwidth* (see table 4.10-1, D6.16) 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 *Radio Bandwidth* (see table 4.10-1, D6.16).

- Each concerned band shall be considered as an independent band and the carrier placement in each band shall be according to the test configuration referenced in Table 4.11.2.8.1.2-1, where the declared parameters for multi-band operation shall apply. The mirror image of the single band test configuration shall be used in the highest band being tested for the *TAB connector.*

- If a *multi‑band TAB connector* 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* ( see table 4.10-1, D6.16) in the other band.

- If the sum of the *base Station RF bandwidths* of each of the supported operating bands is greater than the declared *Radio Bandwidth* (see table 4.10-1, D6.16) for the declared band combinations (see table 4.10-1, D6.41) of the *TAB connector* 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 *Radio Bandwidth* (see table 4.10-1, D6.16) of the *TAB connector* is not exceeded and vice versa.

- If the sum of the maximum number of supported carrier of each supported operating bands for the *multi-band TAB connector* is larger than the declared total number of supported carriers for the declared band combinations (see table 4.10-1, D6.42) of the AAS BS, 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.

*------------------------------ Unchanged part omitted ------------------------------*

*------------------------------ Next modified section ------------------------------*

##### 4.11.2.8.2 ATC5b: MB-MSR test configuration with high PSD per carrier

4.11.2.8.2.1 General

The purpose of ATC5b 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 ATC5b generation

ATC5b is based on re-using the existing test configurations applicable per band on *multi-band TAB connectors.* ATC5b is constructed using the following method:

- The *Base Station RF Bandwidth* of each supported operating band shall be the declared maximum *Base Station RF Bandwidth* (see table 4.10-1, D6.16) of the *multi-band TAB connector.*

- The allocated *Radio Bandwidth* of the outermost bands shall be located at the outermost edges of the declared maximum *Radio Bandwidth* (see table 4.10-1, D6.16).

- 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* (see table 4.10-1, D6.16).

- Each concerned band shall be considered as an independent band and the carrier placement in each band shall be according to the test configuration referenced in Table 4.11.2.8.2.2-1, where the declared parameters for multi-band operation shall apply. 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 the *TAB connector.*

- For AAS BS supporting CSA4 in the band, if a *multi-band TAB connector* supports three carriers only, two carriers shall be placed in one band according to ATC2 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 *base Station RF bandwidths* of each of the supported operating bands is greater than the declared *Radio Bandwidth* (see table 4.10-1, D6.16) for the declared band combinations (see table 4.10-1, D6.41) of the *TAB connector* 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 *Radio Bandwidth* (see table 4.10-1, D6.16) of the *TAB connector* is not exceeded and vice versa.

*------------------------------ Unchanged part omitted ------------------------------*

*----------------------------- End of modified section ------------------------------*