**3GPP TSG- Meeting #**

**, , - revision of S4-240049**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  |
| *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 | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:***  |  |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *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 canbe 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | For headset UE (receive only), desktop hands-free UE, and handheld hands-free UE, currently no tolerance masks are defined for frequency response measurements in SWB mode. Defining these performance requirements is part of the work item eUET. |
|  |  |
| ***Summary of change:*** | Limits for frequency masks in SWB mode are introduced. |
|  |  |
| ***Consequences if not approved:*** | For headset UE (receive only), desktop hands-free UE, and handheld hands-free UE are lacking performance requirements for frequency response measurements. |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **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:*** |  |
|  |  |
| ***This CR's revision history:*** | S4-231778 – Initial proposal, submitted for SA4#126.S4-231974 – Agreed as basis for further work at SA4#126 plenary.S4-240049 – Submitted for SA4#127 with some corrections |

## 4.3 Acoustical interfaces

The following classes of acoustical interface are considered in this specification:

- Handset UE including softphone UE used as a handset;

- Headset UE including softphone UE used with headset;

- Desktop-mounted hands-free UE including softphone UE with external loudspeaker(s) used in hands-free mode; UEs with integrated loudspeakers in hands-free mode are excluded from this UE class.

- Hand-held hands-free UE including softphone UE with internal loudspeaker(s) used in hands-free mode.

(See definition of softphone in Clause 3.1)

Vehicle Mounted Hands-free UE is out of scope. In case performance evaluations are planned for Vehicle Mounted Hands-free UE, test setup, methods and requirements specified in Recommendation ITU-T P.1100 [21] (for NB), P.1110 [22] (for WB) or P.1120 [23] (for SWB and FB) can be used.

The requirements and performance objectives for a softphone UE shall be derived according to the following rules:

- When using a softphone UE as a handset: requirements and performance objectives shall correspond to handset mode.

- When using a softphone UE with headset: requirements and performance objectives shall correspond to headset mode.

- When using a softphone UE in hands-free mode:

- When using internal loudspeaker(s), requirements and performance objectives shall correspond to hand-held hands-free.

- When using external loudspeaker(s), requirements and performance objectives shall correspond to desktop-mounted hands-free.

#### 7.4.2.2 Headset UE receiving

The sensitivity/frequency characteristics shall be as follows:

The receiving sensitivity frequency response, measured either from the digital interface to the DRP with diffuse-field correction or from the SS audio input (analogue or digital input of the reference speech encoder of the SS) to the DRP with diffuse-field correction,shall be within a mask, which can be drawn with straight lines between the breaking points in table 21 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 21: Headset receiving sensitivity/frequency requirement mask

|  |  |  |
| --- | --- | --- |
| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| 100 | [5-6] |  |
| 200 | [5…6] | [-10 … -8] |
| 250 | [5…6] | [-6 … -5] |
| 1000 | [5…6] | [-6 … -5] |
| 2000 | [5…8] | [-6 … -5] |
| 8000 | [5…8] | [-6 … -5] |
| 12500 | [5…8] | [-12 … -11] |
| 16000 | [5…8] |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be confirmed, revised or removed based on future studies. |

It is recommended as a performance objective that the receiving sensitivity/frequency response be within the mask which can be drawn with straight lines between the breaking points in table 22.

Table 22: Headset receiving sensitivity/frequency objective mask

|  |  |  |
| --- | --- | --- |
| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| 100 | [4] |  |
| 200 | [4] | [-4] |
| 250 | [4] | [-4] |
| 1000 | [4] | [-4] |
| 2000 | [4] | [-4] |
| 8000 | [4] | [-4] |
| 12500 | [4] | [-7] |
| 16000 | [4] |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be confirmed, revised or removed based on future studies. |

TBD

Figure 17: Headset receiving sensitivity/frequency masks

Compliance shall be checked by the relevant test described in TS 26.132.

### 7.4.3 Desktop hands-free UE sending

The sending sensitivity frequency response from the MRP to the SS audio output (digital output of the reference speech decoder of the SS) shall be as follows:

The sending sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 23 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 23: Desktop hands-free sending sensitivity/frequency requirement mask

|  |  |  |
| --- | --- | --- |
| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| 100 | [0...5] |  |
| 200 | 5 | -5 |
| 8000 | 5 | -5 |
| 12500 | 5 | -10 |
| 16000 | 5 |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be defined as single values based on future studies. |

It is recommended as a performance objective that the sending sensitivity/frequency response be within the mask which can be drawn with straight lines between the breaking points in table 24.

Table 24: Desktop hands-free sending sensitivity/frequency objective mask

|  |  |  |
| --- | --- | --- |
| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| 100 | [0…4] |  |
| 200 | 4 | -4 |
| 8000 | 4 | -4 |
| 12500 | 4 | -6 |
| 16000 | 4 |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be confirmed, revised or removed based on future studies. |

TBD

Figure 18: Desktop hands-free sending sensitivity/frequency masks

Compliance shall be checked by the relevant test described in TS 26.132.

### 7.4.4 Desktop hands-free UE receiving

The receiving sensitivity frequency response from the SS audio input (analogue or digital input of the reference speech encoder of the SS) to the free-field shall be as follows:

The receiving sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 25 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 25: Desktop hands-free receiving sensitivity/frequency requirement mask

| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| --- | --- | --- |
| 125 | 8 |  |
| 200 | 8 | -9 |
| 250 | 8 | -9 |
| 315 | 7 | -6 |
| 400 | 6 | -6 |
| 8 000 | 6 | -6 |
| 12 500 | 6 | -9 |
| 16 000 | 6 |  |
| NOTE: All sensitivity values are expressed in dB on an arbitrary scale. |

It is recommended as a performance objective that the receiving sensitivity frequency response be within the mask which can be drawn with straight lines between the breaking points in table 26 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 26: Desktop hands-free receiving sensitivity/frequency objective mask

|  |  |  |
| --- | --- | --- |
| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| 100 | 6 |  |
| 200 | 6 | -9 |
| 250 | 6 | -6 |
| 315 | 6 | -6 |
| 12 500 | 6 | -6 |
| 16 000 | 6 |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale. |



Figure 19: Desktop hands-free receiving sensitivity/frequency masks

Compliance shall be checked by the relevant test described in TS 26.132.

### 7.4.5 Hand-held hands-free UE sending

The sending sensitivity frequency response from the MRP to the SS audio output (digital output of the reference speech decoder of the SS) shall be as follows:

The sending sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 27 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 27: Hand-held hands-free sending sensitivity/frequency requirement mask

|  |  |  |
| --- | --- | --- |
| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| 100 | [0...5] |  |
| 200 | [4...5] | [-5...-4] |
| 8000 | [4...5] | [-5...-4] |
| 12500 | [4...5] | [-10…-6] |
| 16000 | [4...5] |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be defined as single values based on future studies. |

It is recommended as a performance objective that the sending sensitivity/frequency response be within the mask which can be drawn with straight lines between the breaking points in table 28.

Table 28: Hand-held hands-free sending sensitivity/frequency objective mask

|  |  |  |
| --- | --- | --- |
| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| 100 | [0…3] |  |
| 200 | [3…4] | [-4…-3] |
| 8000 | [3…4] | [-4…-3] |
| 12500 | [3…4] | [-6…-5] |
| 16000 | [3…4] |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be confirmed, revised, or removed, based on future studies. |

TBD

Figure 20: Hand-held hands-free sending sensitivity/frequency masks

Compliance shall be checked by the relevant test described in TS 26.132.

### 7.4.6 Hand-held hands-free UE receiving

The receiving sensitivity frequency response from the SS audio input (analogue or digital input of the reference speech encoder of the SS) to the free-field shall be as follows:

The receiving sensitivity frequency response shall be within the mask which can be drawn with straight lines between the breaking points in table 29 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 29: Hand-held hands-free receiving sensitivity/frequency requirement mask

| Frequency (Hz) | Upper limit (dB) | Lower limit (dB) |
| --- | --- | --- |
| 100 | 6 |  |
| 630 | 6 | [-12…-6] |
| 800 | 6 | -6 |
| 8 000 | 6 | -6 |
| 12 500 | 6 | -12 |
| 16 000 | 6 |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be confirmed, revised, or removed, based on future studies. |

It is recommended as a performance requirement that the receiving sensitivity frequency response be within the mask which can be drawn with straight lines between the breaking points in table 30 on a logarithmic (frequency) - linear (dB sensitivity) scale.

Table 30: Hand-held hands-free receiving sensitivity/frequency objective mask

|  |  |  |
| --- | --- | --- |
| **Frequency (Hz)** | **Upper limit (dB)** | **Lower limit (dB)** |
| 100 | [6] | [] |
| 400 | [6] | [-12…-6] |
| 500 | [6] | [-6] |
| 8 000 | [6] | [-6] |
| 12 500 | [6] | [-12] |
| 16 000 | [6] |  |
| NOTE 1: All sensitivity values are expressed in dB on an arbitrary scale.NOTE 2: Values within [] are provisional and expected to be confirmed, revised, or removed, based on future studies. |

TBD

Figure 21: Hand-held hands-free receiving sensitivity/frequency masks

Compliance shall be checked by the relevant test described in TS 26.132.