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**Digital cellular telecommunications system (Phase 2+);**
**Universal Mobile Telecommunications System (UMTS);**
**LTE;**
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**Performance characterisation of default codecs**
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# Foreword

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# 1 Scope

The present document provides information on the performances of default speech codecs in packet switched conversational multimedia applications. The codecs under test are AMR-NB (Adaptive Multi-Rate Narrowband) and AMR-WB (Adaptive Multi-Rate Wideband). In addition, several ITU-T codecs (G.723.1, G.729, G.722 and G.711) are included in the testing. Experimental test results from the speech quality testing are reported to illustrate the behaviour of these codecs.

The results give information of the performance of PS conversational multimedia applications under various operating and transmission conditions (e.g., considering radio transmission errors, IP packet losses, end-to-end delays, and several types of background noise). The performance results can be used e.g. as guidance for network planning and to appropriately adjust the radio network parameters.

# 2 References

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[1] ITU-T Recommendation P.800: "Methods for Subjective Determination of Transmission Quality".

[2] ITU-T Recommendation P.831: "Subjective performance evaluation of network echo cancellers".

[3] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[4] ITU-T Recommendation G.729: "Coding of speech at 8 kbit/s using conjugate-structure algebraic-code-excited linear-prediction (CS-ACELP)".

[5] ITU-T Recommendation G.723.1: "Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 kbit/s".

[6] ITU-T Recommendation G.722: "7 kHz audio-coding within 64 kbit/s".

[7] IETF RFC 1889: "RTP: A Transport Protocol for Real-Time Applications".

[8] IETF RFC 3267: "Real-Time Transport Protocol (RTP) Payload Format and File Storage Format for the Adaptive Multi-Rate (AMR) Adaptive Multi-Rate Wideband (AMR-WB) Audio Codecs".

[9] 3GPP TS 34.121: "Terminal Conformance Specification, Radio Transmission and Reception (FDD)" (downlink).

[10] 3GPP TS 25.141: " Base Station (BS) conformance testing (FDD)" (uplink).

[11] 3GPP TR 25.853 "Delay budget within the access stratum".

[12] 3GPP TS 26.235: "Packet switched conversational multimedia applications; Default codecs".

[13] 3GPP TS 26.071: "AMR speech Codec; General description".

[14] 3GPP TS 26.171: "AMR speech codec, wideband; General description".

[15] 3GPP TS 25.322: "Radio Link Control (RLC) protocol specification".

[16] IETF RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP, and uncompressed".