SLOVENSKI STANDARD
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Digitalni celiļ ni telekomunikacijski sistem ï Detektor govornih dejavnosti (VAD) v prometnih kanalih izboljģanega govora s polno hitrostjo (EFR) (GSM 06.82)

Digital cellular telecommunications system; Voice Activity Detector (VAD) for Enhanced Full Rate (EFR) speech traffic channels (GSM 06.82)

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GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

Digital cellular telecommunications system; Voice Activity Detector (VAD) for Enhanced Full Rate (EFR) speech traffic channels (GSM 06.82)

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS specifies the Voice Activity Detector (VAD) to be used in the Discontinuous Transmission (DTX) for Enhanced Full Rate (EFR) speech traffic channels within the digital cellular telecommunications system.

This ETS corresponds to GSM technical specification, GSM 06.82, version 5.0.3

Transposition dates	
Date of adoption:	28 February 1997
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1 Scope

This European Telecommunication Standard (ETS) specifies the Voice Activity Detector (VAD) to be used in the Discontinuous Transmission (DTX) as described in GSM 06.81 (ETS 300 729) [5] Discontinuous transmission (DTX) for Enhanced Full Rate (EFR) speech traffic channels.

The requirements are mandatory on any VAD to be used either in GSM Mobile Stations (MS)s or Base Station Systems (BSS)s that utilize the enhanced full-rate speech traffic channel.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1] GSM 01.04 (ETR 100): "Digital cellular telecommunications system (Phase 2); Abbreviations and acronyms".

[2] GSM 06.53 (ETS 300 724): "Digital cellular telecommunications system; ANSI-C code for the GSM Enhanced Full Rate (EFR) speech codec".

[3] GSM 06.54 (ETS 300 725): "Digital cellular telecommunications system (Phase 2); Test vectors for the GSM Enhanced Full Rate (EFR) speech codec".

[4] GSM 06.60 (ETS 300 726): "Digital cellular telecommunications system; Enhanced Full Rate (EFR) speech transcoding".

[5] GSM 06.81 (ETS 300 729): "Digital cellular telecommunications system; Discontinuous transmission (DTX) for Enhanced Full Rate (EFR) speech traffic channels".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

noise: The signal component resulting from acoustic environmental noise.

mobile environment: Any environment in which mobile stations may be used.

3.2 Symbols

For the purposes of this ETS, the following symbols apply.

3.2.1 Variables

aav1 filter predictor values, see subclause 5.2.3

acf the ACF vector which is calculated in the speech encoder (GSM 06.60 (ETS 300 726) [4])

adaptcount secondary hangover counter, see subclause 5.2.6

av0 averaged ACF vector, see subclause 5.2.2

av1 a previous value of av0, see subclause 5.2.2

burstcount speech burst length counter, see subclause 5.2.8

den	denominator of left hand side of equation 8 in annex B, see subclause 5.2.5
difference	difference between consecutive values of dm, see subclause 5.2.4
dm	spectral distortion measure, see subclause 5.2.4
hangcount	primary hangover counter, see subclause 5.2.8
lagcount	number of subframes in current frame meeting periodicity criterion, see subclause 5.2.9
lastdm	previous value of dm, see subclause 5.2.4
lags	the open loop long term predictor lags for the two halves of the speech encoder frame (GSM 06.60 (ETS 300 726) [4])
num	numerator of left hand side of equation 8 in annex B, see subclause 5.2.5
oldlagcount	previous value of lagcount, see subclause 5.2.9
prederr	fourth order short term prediction error, see subclause 5.2.5
ptch	Boolean flag indicating the presence of a periodic signal component, see subclause 5.2.9
pvad	energy in the current filtered signal frame, see subclause 5.2.1
rav1	autocorrelation vector obtained from av1, see subclause 5.2.3
rc	the first four unquantized reflection coefficients calculated in the speech encoder (GSM 06.60 (ETS 300 726) [4])
rvad	autocorrelation vector of the adaptive filter predictor values, see subclause 5.2.6
smallag	difference between consecutive lag values, see subclause 5.2.9
stat	Boolean flag indicating that the frequency spectrum of the input signal is stationary, see subclause 5.2.4
thvad	adaptive primary VAD threshold, see subclause 5.2.6
tone	Boolean flag indicating the presence of an information tone, see subclause 5.2.5
vadflag	Boolean VAD decision with hangover included, see subclause 5.2.8
veryoldlagcount	previous value of oldlagcount, see subclause 5.2.9
vvad	Boolean VAD decision before hangover, see subclause 5.2.7

3.2.2 Constants

adp	number of frames of hangover for secondary VAD, see subclause 5.2.6
burstconst	minimum length of speech burst to which hangover is added, see subclause 5.2.8
dec	determines rate of decrease in adaptive threshold, see subclause 5.2.6
fac	determines steady state adaptive threshold, see subclause 5.2.6
frames	number of frames over which av0 and av1 are calculated, see subclause 5.2.2
freqth	threshold for pole frequency decision, see subclause 5.2.5
hangconst	number of frames of hangover for primary VAD, see subclause 5.2.8
inc	determines rate of increase in adaptive threshold, see subclause 5.2.6
lthresh	lag difference threshold for periodicity decision, see subclause 5.2.9
margin	determines upper limit for adaptive threshold, see subclause 5.2.6
nthresh	frame count threshold for periodicity decision, see subclause 5.2.9
plev	lower limit for adaptive threshold, see subclause 5.2.6
predth	threshold for short term prediction error, see subclause 5.2.5
pth	energy threshold, see subclause 5.2.6
thresh	decision threshold for evaluation of stat flag, see subclause 5.2.4

3.2.3 Functions

+	addition
-	subtraction
*****	multiplication
/	division
| x |	absolute value of x
AND	Boolean AND
OR	Boolean OR
b	
MULT(x(i))	the product of the series x(i) for i=a to b
i=a	
b	
SUM(x(i))	the sum of the series x(i) for i=a to b
i=a	