- **eXpressDSP Digital Media (XDM) compliant**
- **Mixed C and C64x+ assembly code implementation**
- **Bit-exact with 3GPP GSMWBAMR reference C code on all test sequences**
- **Compliant with 3GPP TS 26.173 v6.0.0 (Adaptive Multi-rate Wide Band Speech Codec ANSI C Code) for all test sequences defined in 3GPP TS 26.174 v6.0.0 (Adaptive Multi-rate Wideband Speech Codec Test Sequences)**
- **Control of the following encoder options - rate and VAD (Voice Activity Detector)**
- **Little Endian mode of operation supported**
- **Interface Format1 (with and without CRC) and Interface Format2 as specified by 26.201 v6.0.0 supported**
- **MIME File Storage Format (MMS_IO) as specified in 26.173 v6.0.0 and RFC3267 Section 5.3 supported**

description

The GSMWBAMR (Wide Band Adaptive Multi_Rate) codec is based on Code Excited Linear Prediction (CELP) algorithm. This codec has been validated on DM6467 hardware, using Code Composer Studio version 3.3.38.2 with the code generation tools version 6.0.7.

PRODUCT PREVIEW

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summary of performance

Table 1. Configuration Table

CONFIGURATION	ID
Encoder with VAD Status ON (Little Endian) on DM6467 hardware with 32 KB L-1P, 16 KB L-1D, 64 KB L-2, Program and Data in L2 and Cache flushed every frame	WBAMR_001
Decoder (Little Endian) on DM6467 with 32 KB L-1P, 16 KB L-1D, 64 KB L-2, Program and Data in L2 and Cache flushed every frame	WBAMR_002
Full Duplex (Little Endian) on DM6467 hardware with 32 KB L-1P, 16 KB L-1D, 64 KB L-2 cache memory, Program and Data in L2 and Cache flushed every frame	WBAMR_003

Table 2. Cycles Information – Profiled on DM6467 with Code Generation Tools Version 6.0.7

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGACYCLES /SEC)[1]	
	AVERAGE	PEAK
WBAMR_001	19.74	20.53
WBAMR_002	5.80	6.01
WBAMR_003	25.54	26.54

[1] Measured with frame size= 320 samples (20 ms)

Table 3. Memory Statistics - Generated with Code Generation Tools Version 6.0.7

CONFIGURATION ID	MEMORY STATISTICS[2]				
	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
WBAMR_001	101.918	38.057	0	1.100	141.075
WBAMR_002	50.363	31.791	0	0.600	82.754
WBAMR_003	133.031	39.580	0	1.100	173.711

[2] All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes).

Table 4. Internal Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – INTERNAL[3]		
	SHARED		INSTANCE[4]
	CONSTANTS	SCRATCH	
WBAMR_001	26.596	8.711	2.750
WBAMR_002	26.596	3.672	1.523
WBAMR_003	26.596	8.711	4.273

[3] All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes).
[4] Does not include I/O buffers

notes

- I/O Buffers – Encoder: Input Buffer Size = 640 bytes, Output Buffer Size (maximum) = 63 bytes for Interface Format 1, 61 bytes for Interface Format 2 and MMS_IO packing format
- I/O Buffers – Decoder: Input Buffer Size (maximum) = 63 or 61 bytes, Output Buffer Size = 640 bytes.
- All I/O buffers should be half-word (16-bit) aligned.
- The cycles information presented in Table 2 is with Frame Format selected as Interface Format 1 with CRC computation. This is the most cycle intensive frame format.

references

- 3GPP TS 26.171 V6.0.0: AMR Wideband Speech CODEC; General Description
- 3GPP TS 26.173 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; ANSI C Source Code
- 3GPP TS 26.174 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Test Sequences
- 3GPP TS 26.190 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Transcoding Functions
- 3GPP TS 26.191 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Error Concealment of Lost Frames
- 3GPP TS 26.192 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Comfort Noise Aspects
- 3GPP TS 26.193 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Source Controlled Rate Operation
- 3GPP TS 26.194 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Voice Activity Detector (VAD)
- 3GPP TS 26.201 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Frame Structure
- 3GPP TS 26.202 V.6.0.0: Adaptive Multi-Rate Wideband Speech Codec; Interface to Iu, Uu and Nb
- GSMWBAMR User Guide on DM6467(literature number: SPRUFE2)

glossary

Constants	Elements that go into .const memory section
Scratch	Memory space that can be reused across different instances of the algorithm
Shared	Sum of Constants and Scratch
Instance	Persistent-memory that contains persistent information - allocated for each instance of the algorithm

acronyms

GSM	Global System for Mobile Communication
WBAMR	Wideband Adaptive Multi-Rate
VAD	Voice Activity Detector

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