



- 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.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

All trademarks are the property of their respective owners.
DAVINCI and DAVINCI logo are trademarks of Texas Instruments Incorporated.

PRODUCT PREVIEW information concerns products in the formative or design phase of development. Characteristic data and other specifications are design goals. Texas Instruments reserves the right to change or discontinue these products without notice.



Copyright © 2007, Texas Instruments Incorporated

PRODUCT PREVIEW



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

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement

specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related

requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
Low Power Wireless	www.ti.com/lpw	Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments
Post Office Box 655303 Dallas, Texas 75265