GSM AMR Speech Coder

Adaptive Multi-rate

PRODUCT DESCRIPTION

GSM-AMR is an adaptive multi-rate speech coder that has been standardized for use in Third Generation (3G) mobile telephony. The coder supports eight bit rates: 12.2, 10.2, 7.95, 7.40, 6.7, 5.9, 5.15, and 4.75 kbps. The coder uses algebraic code excited linear prediction (ACELP) as the compression method. AMR also includes Voice Activity Detection (VAD) and Discontinuous Transmission (DTX) as an added way to save bandwidth by sending fewer bits per second when the user is not speaking.

FEATURES

- Functions are C-callable
- Multi-channel capable
- Complies with ETSI test vectors (bit-exact)
- Can be integrated with echo cancellers, and tone detection/regeneration
- Includes VAD and DTX

AVAILABILITY

ADT AMR is available on the following Platforms: Other configurations are available upon request.

Product	Platform	Memory Model	Endian	Code Gen Tool Version
ADT_amr_c64xp / c66x	TI TMS320C64x+ / C66x	MmL3	Little	V7.2.4
ADT_amr_c64x	TI TMS320C64x	MmL3	Little	V7.2.4
ADT_amr_c55x	TI TMS320C55x	Far	Little	N/A
ADT_amr_c54x	TI TMS320C54x	N/R	N/A	N/A

*Endian, byte order: “Little Endian” means that the low-order byte of the number is stored in memory at the lowest address, and the high-order byte at the highest address. "Big Endian" means that the high-order byte of the number is stored in memory at the lowest address, and the low-order byte at the highest address.

Acronyms

Mm – Memory Model: Memory Model is specific to Texas Instruments processors.

N/A – Not Applicable

N/R – Not Recorded

SPECIFICATIONS

Coding Rate: 12.2, 10.2, 7.95, 7.40, 6.7, 5.9, 5.15, and 4.75 kbps

Sampling Rate: 8 kHz

Delay: 20 milliseconds

TI TMS320C6000

C64x+/C66x

CPU UTILIZATION & MEMORY REQUIREMENTS

All Memory usage is given in units of byte.

Software	MIPS (Peak) *	Program Memory	Data Memory	Per-Channel Data Memory	Scratch Memory
Encoder (Vad1)	13.1	78772	31158	1992	9280
Encoder (Vad2)	13.1	79700	31880	2064	9280
Decoder	2.8	38332	31988	1232	1392
Encoder (Vad1) & Decoder	15.9	109724	32172	3224	10672
Encoder (Vad2) & Decoder	15.9	110652	32892	3296	10672

* Peak Mips figures vary depending on the data rate and whether DTX is enabled. The values listed in the above tables were recorded with DTX disabled, and represent the worst-case across all data rates. The Vad1 option increases MIPS by an extra 0.9 MIPS, and Vad2 increases MIPS by an extra 2.8 MIPS.

C64x

CPU UTILIZATION & MEMORY REQUIREMENTS

All Memory usage is given in units of byte.

Software	MIPS (Peak) *	Program Memory	Data Memory	Per-Channel Data Memory	Scratch Memory
Encoder (Vad1)	13.0	107668	31158	1992	9360
Encoder (Vad2)	13.1	108148	31880	2064	9360
Decoder	2.7	53308	31988	1232	1392
Encoder (Vad1) & Decoder	15.7	150556	32172	3224	10752
Encoder (Vad2) & Decoder	15.7	151036	32892	3296	10752

Last update: 08/2012

TI TMS320C6000

C55x

CPU UTILIZATION & MEMORY REQUIREMENTS

All Memory usage is given in units of byte.

Software	MIPS (Peak)	Program Memory	Data Memory	Per-Channel Data Memory	Scratch Memory
Encoder	17.1	37782	28364	1996	6424
Decoder	2.6	19840	28952	1316	1200

Last update: 07/03/2008

C54x

CPU UTILIZATION & MEMORY REQUIREMENTS

All Memory usage is given in units of 16-bit word.

Software	MIPS	Program Memory	Data Memory	Per-Channel Data Memory	Scratch Memory
Encoder	18.8	19591	16725	1022	5065
Decoder	2.3	8164	13604	650	868
Encoder + Decoder	21.1	25949	16191	1636	5065

Last update: 07/17/2008

FUNCTIONS

API function call summary

`AMR_ADT_encInit(. . .)`	Initializes the AMR encoder
`AMR_ADT_decInit(. . .)`	Initializes the AMR decoder
`AMR_ADT_encode(. . .)`	Executes the AMR encoder
`AMR_ADT_decode(. . .)`	Executes the AMR decoder

Deliverables

The deliverable items are platform dependent. In general, there is one library. (Sometimes multiple variants of the library are included in the deliverables.) There are also header files, some of which are specific to the product and others are common across many of Adaptive Digital's products. Also included in the deliverables is product documentation, which includes a users guide and usually includes release notes and a data sheet. Sample/test code may be included as well.

Adaptive Digital is a member of the Texas Instruments Developer Network, and ARM Connected Community.

CONTACT INFORMATION

Web: www.adaptivedigital.com
Email: information@adaptivedigital.com
Tel: 610.825.0182 ~ Toll Free: 1.800.340.2066
Fax: 610.825.7616
Address: 525 Plymouth Road, Suite 316
Plymouth Meeting, PA 19462