

## VAD / CNG

Voice Activity Detection / Comfort Noise Generation

### PRODUCT DESCRIPTION

Adaptive Digital's VAD/CNG software performs voice activity detection and comfort noise generation. It is used in systems that used reduced bandwidth channels during silent or non-voiced portions of a conversation. The VAD algorithm is used at the transmit side of a communication link. The VAD determines whether or not speech is present in the outbound signal. If speech is not present, the VAD algorithm determines the level of the background noise. The background noise level is transmitted to the opposite end of the link in place of the speech signal. The noise level requires little channel bandwidth and only needs to be transmitted when the background noise level changes. The CNG algorithm runs at the receive side of the link. When speech is not present, the CNG algorithm generates a noise signal at the level sent from the transmit side.

Applications include Voice-Over-Packet, Satellite, and other digital voice applications.

### FEATURES

- Functions are C-callable.
- Multi-channel capable
- Can be used with all types of speech coding
- Spectrally shaped noise generation

### AVAILABILITY

ADT VAD / CNG is available on the following Platforms: Other configurations are available upon request.

Product	Platform	Memory Model	Endian	Code Gen Tool Version
ADT_vadcng_c54x	TI TMS320C54x	Far	N/A	N/R
ADT_vadcng_c55x	TI TMS320C55x	Large	Little	N/R
ADT_vadcng_c64x	TI TMS320C64x	L3	Little	N/R
ADT_vadcng_c64xp	TI TMS320C64x+	Far	Little	CG6_1_15
ADT_vadcngdll_win32	Win32	N/A	Little	VS2010
ADT_vadcnglib_win32	Win32	N/A	Little	VS2010
ADT_vadcng_i686	I686	N/A	Little	gcc
ADT_vagcng_cortex-m3, -m4	Cortex-M3/M4	N/A	Little	2011_09-69_BareMetal
ADT_vadcng_cortex-a8,- a9, -a15	Cortex-A8/A9/A15	N/A	Little	2011_09-70_linux
ADT_cadcng_arm9	ARM9e	N/A	Little	2011_09-70_linux

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

## SPECIFICATIONS

**TI TMS3200****C54x****CPU UTILIZATION & MEMORY REQUIREMENTS**

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

Function	MIPS Per Channel	Program Memory	Data Memory	Per Channel Data Memory
VADCNG_ADT_vad	0.36	423	291	26
VADCNG_ADT_cng	0.47			

**C55x****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of byte.

Function	MIPS Per Channel	Program Memory	Data Memory	Per Channel Data Memory
VADCNG_ADT_vad	0.28	815	582	52
VADCNG_ADT_cng	0.29			

**C64x****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of byte.

Function	MIPS Per Channel	Program Memory	Data Memory	Per Channel Data Memory
VADCNG_ADT_vad	0.19	1728	604	64
VADCNG_ADT_cng	0.15			

**C64x+****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of byte.

Function	MIPS Per Channel	Program Memory	Data Memory	Per Channel Data Memory
VADCNG_ADT_vad	0.47	2,784	2,800	212
VADCNG_ADT_cng	1.5			

**PC-WINDOWS****Win DLL****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of bytes.

Function	MIPS	Program Memory	Data Memory	Per Channel Data Memory	Scratch Memory
VADCNG_ADT_vad	0.13	2.7k	0	80	0
VADCNG_ADT_cng	0.53				0

**Win Static Library****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of bytes.

Function	MIPS	Program Memory	Data Memory	Per Channel Data Memory	Scratch Memory
VADCNG_ADT_vad	0.16	2.7K	0	80	0
VADCNG_ADT_cng	0.62				0

**ARM® DEVICES****Arm9e****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of bytes.

Function	MIPS	Program Memory	Data Memory	Per Channel Data Memory	Scratch Memory
VADCNG_ADT_vad	0.22	4k	336	80	0
VADCNG_ADT_cng	1.22				0

**Arm Cortex-M3/M4****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of bytes.

Function	MIPS	Program Memory	Data Memory	Per Channel Data Memory	Scratch Memory
VADCNG_ADT_vad	??	?	?	80	0
VADCNG_ADT_cng	??				0

**Arm Cortex-A8/A9/A15****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of bytes.

Function	MIPS	Program Memory	Data Memory	Per Channel Data Memory	Scratch Memory
VADCNG_ADT_vad	0.26	4k	336	80	0
VADCNG_ADT_cng	1.3				0

**LINUX****i686****CPU UTILIZATION & MEMORY REQUIREMENTS**

All Memory usage is given in units of bytes.

Function	MIPS	Program Memory	Data Memory	Per Channel Data Memory	Scratch Memory
VADCNG_ADT_vad	0.13	2.8K	412	80	0
VADCNG_ADT_cng	0.62				0

We specify MIPS (Millions of Instructions per Second) as MCPS (Millions of Instruction Cycles per Second). Unless otherwise specified, peak MIPS are indicated.

## FUNCTIONS

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### API function call summary

VADCNG_ADT_init (. . .)	Initializes VAD/CNG
VADCNG_ADT_vad (. . .)	Perform voice activity detection
VADCNG_ADT_cng (. . .)	Perform comfort noise generation

### 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

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