



## ITU G.729/G.729+B Speech Coder

### SIGNALS+SOFTWARE

#### Processor

Texas Instruments TMS320C5000 DSP range.



#### Background

The algorithms implemented are the ITU-T recommendations G.729 and G.729 Annex B fixed rate speech coders for internet and multimedia communications. The encoder G.729 compresses linear narrowband speech data at a sample rate of 8kHz to a data rate of 8 000 bps.

G.729 Annex B comprises of G.729 with the additional option of Annex B. Annex B implements silence compression techniques to reduce the transmitted bit rate during the silent intervals of speech. Voice Activity Detection (VAD) and Comfort Noise Generation (CNG) algorithms are used to enable the transmission of Silence Descriptor (SID) frames during the periods of silence. This provides the additional advantage of using lower processing loads and DSP bandwidth resource during silence intervals.

#### Features and Performance

- TI eXpressDSP™ Compliant software available
- 4 channels of G.729 on 100MHz device
- 4 channels of G.729+B on 100MHz device
- Less than 24Kbytes program memory will be required for either G.729 or G.729+B

G.729	Program Memory		Data Memory			Interrupt Latency (Cycles)	Typical call Period (ms)	Processing Load (MHz)
	Code (Kbytes)	Tables (Kbytes)	Static Memory		Stack Memory (Kbytes)			
			Heap (Kbytes)	Tables (Kbytes)				
Encoder	12.2	0.03	n * 1.8	5.6	2.5	239	10	n * 20.0
Decoder	6.4	0.03	n * 1.1	5.1	1.7	234	10	n * 3.2
Encoder + Decoder	16.9	0.05	n * 2.9	6.0	2.5	239	10	n * 23.2

Table 1 : DSP Requirements for G.729

G.729+B	Program Memory		Data Memory			Interrupt Latency (Cycles)	Typical call Period (ms)	Processing Load (MHz)
	Code (Kbytes)	Tables (Kbytes)	Static Memory		Stack Memory (Kbytes)			
			Heap (Kbytes)	Tables (Kbytes)				
Encoder	18.4	0.03	n * 2.1	6.2	2.5	239	10	n * 20.2
Decoder	8.6	0.03	n * 1.1	5.5	1.7	234	10	n * 3.3
Encoder + Decoder	23.7	0.05	n * 3.2	6.6	2.5	239	10	n * 23.4

Table 2 : DSP Requirements for G.729+B

**Note:** Processing loads quote worst-case scenarios with n representing the number of channels. Program memory table values are initialisation values. Kbytes equals 1024 bytes.

### Interface Details

The eXpressDSP™ G.729 and G.729+B software uses the IG729 interface specified by Texas Instruments in the eXpressDSP™ developers' kit.

The software is also available in a non-eXpressDSP version with a basic multi-channel interface. The DSP requirements for this version are similar to those given in Table 1.

### Availability

G.729 and G.729+B code is now available, for a one-off payment and/or royalties depending on the commercial application.

Software for the TMS320C5000 is available for a full range of vocoders including G.711, G.723.1, G.726, G.728, G.729A, G.729A+B, and for other communication algorithms. G.729 and G.729+B are also available for the TMS320C6000.

## SIGNALS+SOFTWARE

**SIGNALS+SOFTWARE** was founded in 1992 as a developer of high quality Digital Signal Processing application software for the communications industry. Supplying to a whole range of customers, including large blue chip corporations, **SIGNALS+SOFTWARE** has quickly established itself as the world leader in DSP software design and production.

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