Data Sheet

ITU G.711 Speech Coder

SIGNALS+SOFTWARE

Processor

Texas Instruments TMS320C6000 DSP range.

Background

The algorithm implemented is the ITU-T recommendation G.711 audio coder. The encoder compresses linear narrowband audio input data, at a sample rate of 8kHz, to a data rate of 64 000 bps, using non-linear quantisation. G.711 is a simple algorithm, using two selectable logarithmic coding laws, A-law (European standard) and μ–law (US standard).

G.711 is the mandatory minimum standard for all ISDN terminal equipment.

Features and Performance

- TI eXpressDSP™ Compliant software available
- Approximately 540 channels of G.711 on a 200MHz device
- Less than 3K of program memory required

G.711	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	1.03	0.05	n * 0.01	0.04	0.02	50	10	n * 0.20
Decoder	1.01	0.05	n * 0.01	0.04	0.01	50	10	n * 0.17
Encoder + Decoder	2.04	0.10	n * 0.01	0.08	0.02	50	10	n * 0.37

Table 1 : DSP Requirements for G.711

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.
The specified program memory sizes include both A-law and μ-law.

Technical Notes

The figures given in Table 1 are based on a per-sample implementation of G.711. Significantly lower processing loads are possible with block-based processing.

The software is written using only fixed-point instructions and is compatible with both the TMS320C6000 fixed-point family and the TMS320C6700 floating-point family. It is supplied in both big-endian and little-endian variants.

G.711 is often used at rates less than 64 000 bps, namely 56 000 and 48 000 bps, with a slight reduction in speech quality. This allows an 8 000 bps or 16 000 bps auxiliary data channel.

Interface Details

The eXpressDSP™ G.711 software uses the IG711 interface specified by Texas Instruments in the eXpressDSP™ developers' kit.

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

Availability

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

Software for the TMS320C6000 is available for a full range of vocoders including G.722, G.723.1, G.726, G.728, G.729, G.729A, G.729B, G.729AB, and for other communication algorithms. G.711 is also available for the TMS320C5000.

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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