- **Compliant with the eXpressDSP Digital Media (XDM) interface**
- **A-law and U-law compression (encoding) and decompression (decoding) supported**
- **Operates on sets of 8 samples**
- **Little endian mode of operation supported.**
- **Validated on C6472 EVM with Code Composer Studio version 5.2.1.00018 and code generation tools version 7.3.2**
- **This codec can be used on other C64x+ platforms like C6455, DM648, DM6437, DM644X, DM6467, OMAP3430, OMAP3530**

description

G.711 is one of the earliest speech coders that convert 16-bit linear PCM samples to 8-bit compressed A-law or U-law samples to give a 64Kbps data rate in the encoder. Decoder expands 64Kbps bit stream into linear PCM samples of 16-bits each at 8 KHz.

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summary of performance

Table 1.   Configuration Table

CONFIGURATION	ID
Encoder(Little Endian) – 10ms	G711_001
Decoder(Little Endian) – 10ms	G711_002
Full Duplex(Little Endian) – 10ms	G711_003
Encoder(Big Endian) – 10ms	G711_004
Decoder(Big Endian) – 10ms	G711_005
Full Duplex(Big Endian) – 10ms	G711_006

Table 2.   Cycles Information – – Profiled on TMS320C6472 EVM (COFF Library)

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGA CYCLES PER SEC)[1, 2]	
	AVERAGE	PEAK
G711_001	0.304	0.306
G711_002	0.253	0.263
G711_003	0.558	0.571
G711_004	0.324	0.332
G711_005	0.242	0.259
G711_006	0.566	0.591

[1] Measured with frame size= 160 samples (10ms)
[2] Measured with 32K L1Pconfigured as cache, 32K L1D configured as cache, 2MB L2 configuration and with all Program and Data in L2 configured as SRAM. L1P and L1D invalidated before encoder/decoder execution.
 Cycle numbers vary across C64x+ platforms depending on the size of cache at L1P, L1D, L2, DDR2 clock and DSP clock

Table 3.   Cycles Information – – Profiled on TMS320C6472 EVM (ELF Library)

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGA CYCLES PER SEC)[1, 2]	
	AVERAGE	PEAK
G711_001	0.288	0.334

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G711_002	0.250	0.271
G711_003	0.538	0.605
G711_004	0.258	0.308
G711_005	0.279	0.294
G711_006	0.537	0.602

[1] Measured with frame size= 160 samples (10ms)
[2] Measured with 32K L1Pconfigured as cache, 32K L1D configured as cache, 2MB L2 configuration and with all Program and Data in L2 configured as SRAM. L1P and L1D invalidated before encoder/decoder execution.
Cycle numbers vary across C64x+ platforms depending on the size of cache at L1P, L1D, L2, DDR2 clock and DSP clock

Table 4. Memory Statistics - Generated with Code Generation Tools Version 7.3.2(COFF Library)

CONFIGURATION ID	MEMORY STATISTICS[4]				
	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
G711_001	1.47	0.0039	0	0	1.474
G711_002	1.47	0.0039	0	0	1.474
G711_003	2.94	0.0078	0	0	2.948
G711_004	1.47	0.0039	0	0	1.474
G711_005	1.47	0.0039	0	0	1.474
G711_006	2.94	0.0078	0	0	2.948

[4] All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes).

Table 5. Memory Statistics - Generated with Code Generation Tools Version 7.3.2(ELF Library)

CONFIGURATION ID	MEMORY STATISTICS[4]				
	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
G711_001	1.47	0.0039	0	0	1.474
G711_002	1.47	0.0039	0	0	1.474
G711_003	2.94	0.0078	0	0	2.948
G711_004	1.47	0.0039	0	0	1.474
G711_005	1.47	0.0039	0	0	1.474

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G711_006	2.94	0.0078	0	0	2.948

[4] All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes).

Table 6.   Internal Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – INTERNAL[5]		INSTANCE[6]
	SHARED		
	CONSTANTS	SCRATCH	
G711_001	0	0	0.0039
G711_002	0	0	0.0039
G711_003	0	0	0.0078
G711_004	0	0	0.0039
G711_005	0	0	0.0039
G711_006	0	0	0.0078

[5] All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes)
[6] Does not include I/O buffers

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notes

- Total Data Memory for N Non-Pre-Emptive Instances = Constants + Runtime Tables + Scratch + N*(Instance + I/O buffers + Stack)
- Total Data Memory for N Pre-Emptive Instances = Constants + Runtime Tables + N*(Instance + I/O buffers + Stack + Scratch)

references

- ITU-T Recommendation G.711:Pulse code modulation (PCM) of voice frequencies
- User Guide for G.711 Encoder/Decoder

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

EVM	Evaluation Module
ITU	International Telecommunication Union
ITU-T	Telecommunication Standardization Sector of ITU
PCM	Pulse Code Modulation
XDAIS	eXpressDSP Algorithm Interface Standard
XDM	eXpressDSP Digital Media

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