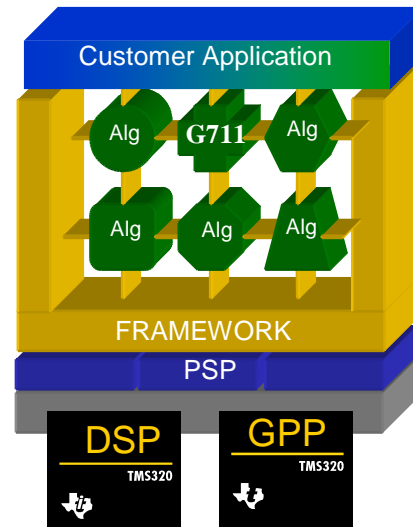




- Mixed C and C64x assembly code implementation
- XDM compliant
- Bit-exact with all ITU G728 test sequences
- Supports both ELF and COFF



## Description

- Bit-exact with ITU-T standard vectors for G728
- Supports frame size in multiples of 2.5ms up to 10ms
- Supports G728 Annex I (Packet Loss Concealment)
- The implementation supports run time data buffers relocation, table relocation.
- The code is fully interruptible
- Fully validated on TMS320C6455 DSK, using CCS version 4.2 with the code generation tools version 7.2.0A10197
- This codec is supported on any C64x+ based devices like TCI6482, DM648/647, TNETV2685, DM6437 etc



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Summary of performance

Table 1. Configuration Table

CONFIGURATION	ID
Encoder	G728_001
Decoder	G728_002
Full Duplex	G728_003

Table 2. Cycles Information -- Profiled on TMS320C6455 DSK(COFF Library)

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGA CYCLES PER SEC) <sup>1,2</sup>	
	AVERAGE	PEAK
G728_001	8.14	8.23
G728_002	7.06	7.31
G728_003	15.20	15.54

<sup>1</sup> Measured with frame size= 20 samples (2.5ms)

<sup>2</sup> Measured with 32K L1P configured 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.

Table 3. Cycles Information -- Profiled on TMS320C6455 DSK(ELF Library)

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGA CYCLES PER SEC) <sup>1,2</sup>	
	AVERAGE	PEAK
G728_001	8.15	8.24
G728_002	7.02	7.27
G728_003	15.17	15.51

<sup>1</sup> Measured with frame size= 20 samples (2.5ms)

<sup>2</sup> Measured with 32K L1P configured 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.

Table 4. Memory Statistics - Generated with Code Generation Tools Version 7.2.0A10197(COFF Library)

CONFIGURATION ID	MEMORY STATISTICS <sup>4</sup>
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	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
G728_001	18.84	4.45	0	0.43	23.72
G728_002	20.53	5.90	0	0.48	26.91
G728_003	30.81	7.30	0	0.48	38.59

<sup>4</sup>All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes).

**Table 5. Memory Statistics - Generated with Code Generation Tools Version 7.2.0A10197(ELF Library)**

CONFIGURATION ID	MEMORY STATISTICS <sup>4</sup>				
	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
G728_001	18.84	4.45	0	0.43	23.72
G728_002	20.53	5.90	0	0.48	26.91
G728_003	30.81	7.30	0	0.48	38.59

<sup>4</sup>All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes).

**Table 6. Internal Data Memory Split-up**

CONFIGURATION ID	DATA MEMORY – INTERNAL <sup>5</sup>		
	SHARED		INSTANCE <sup>6</sup>
	CONSTANTS	SCRATCH	
G728_001	2.34	0.71	1.40
G728_002	2.34	1.15	2.41
G728_003	2.34	1.15	3.81

<sup>5</sup>All memory requirements are expressed in kilobytes (1 kilobyte = 1024 bytes)

<sup>6</sup>Does not include I/O buffers



## Notes

All the performance numbers are including Annex I support

## References

ITU Recommendation – ITU-T G.728 Annex G (11/94) plus Corrigendum 1 (02/00) – 16 kbit/s fixed point specification

## 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

ITU	International Telecommunication Union
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## REVISION HISTORY

**Scope:** Applicable updates to the G728 on TMS320C6455 have been incorporated.

DATE	VERSION	ADDITIONS/CHANGES/DELECTIONS
21 SEPT 2006	1.00	Initial Version
21 Sept 2007	1.04	Validated on TNETV2685 with ROM code
January 2012	2.00	Added ELF support

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