Windows Media VC-1 Decoder (v1.01)on C64x+

FEATURES

- **eXpressDSP™ Algorithm Interface Standard (XDAIS) compliant**
- **eXpressDSP Digital Media (XDM) Interface compliant**
- **Validated on the DM644x EVM**
- **Simple, main, and advanced profile features of the SMPTE FCD1r6 at level 1 (AP@L1) standard up to D1 resolution supported**
- **RCV V1, RCV V2, and elementary input streams supported**
- **YUV 420 and YUV 422 interleaved output formats supported**
- **Considers advanced systems format (ASF) parser as an application layer**
- **Main profile is bit exact with the reference decoder provided by Microsoft®**
- **Advanced profile (VC-1) is bit exact with the SMPTE test cases.**

DESCRIPTION

VC-1 is the Society of Motion Picture and Television Engineers (SMPTE) standardized video decoder. VC-1 consists of three profiles namely, simple, main, and advanced. Simple and main profiles were originally developed for use in lower-bit-rate networked computing environments. The advanced profile adds extensive in-band metadata support to allow for optimized experience on a wide range of display devices.

PRODUCT PREVIEW

Performance Summary

This section describes the performance of Windows Media VC-1 Decoder.

Table 1. Configuration Table

CONFIGURATION	ID
VC-1 Main profile and SMPTE VC-1 features - assumes 64K SRAM on (L1) chip.	CFG001
VC-1 Advanced profile and SMPTE VC-1 features at L0 Level - assumes 64K SRAM on (L1) chip.	CFG002
VC-1 Advanced profile and SMPTE VC-1 features at L1 Level - assumes 64K SRAM on (L1) chip.	CFG003

Table 2. Cycles Information – Profiled on DM644x EVM With Code Generation Tools Version 6.0.7

CONFIGURATION ID	PERFORMACE STATISTICS (MEGA CYCLES PER SECOND)(1)		
	TEST DESCRIPTION	AVERAGE(2)	PEAK(3)
CFG001	Zero_Deint_895kbps_100.rcv YUV420/ VGA @ 895 kbps	146.38	229.24
CFG002	SA00059.vc1 YUV420/CIF @ 800 kbps	61.34	101.46
CFG003	SA10176.vc1 YUV420/PAL-D1 @ 2500 kbps	300.12	399.63

(1) Measured with program memory, stack, and I/O buffers in external memory
(2) Based on average number of cycles per frame @ 30 fps
(3) Based on worst case cycles averaged over 3 consecutive frames @ 30 fps
For D1 (720x576) resolution, Based on average number of cycles per frame @ 25 fps
For D1 (720x576) resolution, Based on worst case cycles averaged over 3 consecutive frames @ 25 fps

Table 3. Memory Statistics - Generated With Code Generation Tools Version 6.0.7

CONFIGURATION ID	MEMORY STASTICS(1)				TOTAL
	PROGRAM MEMORY	DATA MEMORY			
		INTERNAL	EXTERNAL	STACK	
CFG001	270.940	63	3981.035	64	4378.975
CFG002	270.940	63	1949.910	64	2347.850
CFG003	270.940	63	4992.410	64	5390.350

(1) All memory requirements are expressed in kilobytes (1K-byte = 1024 bytes).

Table 4. Internal Data Memory Split-Up

CONFIGURATION ID	DATA MEMORY - INTERNAL(1)		
	SHARED		INSTANCE(2)
	CONSTANTS	SCRATCH	
CFG001	0	63	0
CFG002	0	63	0
CFG003	0	63	0

(1) Internal memory refers to L1DRAM. All memory requirements are expressed in kilobytes and there could be a variation of around 1-2% in numbers.
(2) I/O buffers not included. Some of the instance memory buffers could be scratch.

Table 5. External Data Memory Split-Up

CONFIGURATION ID	DATA MEMORY - EXTERNAL(1)		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
CFG001	215.66	561.375	3204.000
CFG002	215.66	296.500	1437.750
CFG003	215.66	693.375	4083.375

(1) All memory requirements are expressed in kilobytes.

Table 6. Co Processor(s) Memory Statistics

CONFIGURATION ID	SEQ DATA MEMORY	SEQ PROG MEMORY	IMX WORKING MEM	IMX IMG BUF	IMX CMD MEM
CFG001	0	0	0	0	0
CFG002	0	0	0	0	0
CFG003	0	0	0	0	0

Notes

- Memory Configuration
  - L1P : 32K-bytes program cache
  - L1D : 64K-bytes data memory and 16K-bytes data cache
  - L2 : 64K-bytes cache
- Evaluation version performance may be off by up to 30 MHz
- Heap requirement: 5 MB, no optimizations done.

References

- eXpressDSP Kit
- *Windows Media VC-1 Decoder on C64x+ User's Guide* (literature number SPRUEI3A)

Glossary

Term	Description
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

Acronym	Description
AP	Advanced profile
ASF	Advanced systems format
EVM	Evaluation module
fps	Frames per second
MP	Main profile
MPML	Main-profile-at-main level
SMPTE	Society of Motion Picture and Television Engineers
SRAM	Static random access memory
VC-1	SMPTE approved standard corresponding to WMV 9 having AP support also
XDAIS	eXpressDSP Algorithm Interface Standard
XDM	eXpressDSP Digital Media

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