

H.264 Baseline Profile Decoder (v1.00) on DM6467

FEATURES

- eXpressDSP™ Digital Media (XDM 1.2 IVIDDEC2) compliant
- Up to level 4 features of the Baseline Profile (BP) supported
- Validated on DM6467 EVM
- Progressive type picture decoding supported
- Multiple slices and multiple reference frames supported
- CAVLC decoding supported
- All intra-prediction and inter-prediction modes supported
- Up to 16 MV per MB supported
- Frame based decoding supported
- Frame width of the range of 16 to 1920 pixels supported
- Tested for compliance with JM version 10.1

reference decoder

- Long term reference frame and Adaptive reference picture marking
- Reference Picture List Reordering
- PCM Macroblock decoding
- Gaps in frame_num

DESCRIPTION

H.264 is a popular video coding algorithm enabling high quality multimedia services on a limited bandwidth network. H264 Decoder is validated on DM6467 EVM with Code Composer Studio version 3.3.49 and code generation tools version 6.0.8.



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Performance Summary

This section describes the performance of the H.264 Baseline Profile Decoder on DM6467.

Table 1. Configuration Table

CONFIGURATION	ID
H264 Baseline Profile Decoder	DM6467_BP_001

Table 2. Cycles Information-Profiled on DM6467 EVM with Code Generation Tools Version 6.0.8

CONFIGURATION ID	TEST DESCRIPTION	PERFORMANCE STATISTICS (MEGA CYCLES PER SECOND) ⁽¹⁾			
		DSP CYCLES@600MHZ		IMCOP ARM 968 CYCLES@300MHZ	
		AVERAGE ⁽²⁾	PEAK ⁽³⁾	AVERAGE ⁽²⁾	PEAK ⁽³⁾
DM6467_BP_001	riverbed_1920x1080_420p_BP.264; Baseline Profile, Progressive, IPPP...	291.0	308.1	279.3	298.4

- (1) Measured with program memory, stack, and I/O buffers in external memory and with cache configuration 64 K bytes L2 cache, 32 K L1D and 32 K L1P cache.
(2) Average values are calculated based on the average of all frames in the sequence.
(3) Peak values are calculated assuming that the most demanding frame is repeated 30 times in the sequence, rather than finding the most demanding 30 frames sequence in the bit- stream.

Table 3. Cycles Information for 2MB processing - Profiled on DM6467 EVM with Code Generation Tools Version 6.0.8

CONFIGURATION ID	TEST DESCRIPTION	PERFORMANCE STATISTICS (CYCLES FOR 2 MB PROCESSING) ⁽¹⁾			
		DSP CYCLES@600MHZ		IMCOP ARM 968 CYCLES@300MHZ	
		AVERAGE ⁽²⁾	PEAK ⁽³⁾	AVERAGE ⁽²⁾	PEAK ⁽³⁾
DM6467_BP_001	riverbed_1920x1080_420p_BP.264; Baseline Profile, Progressive, IPPP...	2262.3	15680.0	2394.4	6175.2

- (1) Measured with program memory, stack, and I/O buffers in external memory and with cache configuration 64 K bytes L2 cache, 32 K L1D and 32 K L1P cache.
(2) Average values are calculated based on the average of all MB pairs in the sequence
(3) Peak values quoted is the maximum cycles consumed for processing 1 MB pair (2 MBs)

Table 4. Memory Statistics-Generated with Code Generation Tools Version 6.0.8

CONFIGURATION ID	PROGRAM MEMORY	MEMORY STATISTICS ⁽¹⁾			TOTAL
		DATA MEMORY			
		INTERNAL ⁽²⁾	EXTERNAL ⁽³⁾	STACK	
DM6467_BP_001	187.28	23.25	13037.03	4.00	13251.56

- (1) All memory requirements are expressed in kilobytes (1K-byte = 1024 bytes).
(2) Internal memory is placed in L2 SRAM.
(3) Includes frame buffers for 1080p resolution.

Table 5. Internal Data Memory Split-Up

CONFIGURATION ID	DATA MEMORY - INTERNAL ⁽¹⁾		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
DM6467_BP_001	0.00	23.25	0.00

- (1) All memory requirements are expressed in kilobytes.

Table 6. External Data Memory Split-Up

CONFIGURATION ID	DATA MEMORY - EXTERNAL ⁽¹⁾		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
DM6467_BP_001	185.15	0.00	12851.88

(1) All memory requirements are expressed in kilobytes.

Notes

- The entire HDVICP is a video resource and uses 16 K ITCM and 8 K DTCM.

References

- ISO/IEC 14496-10: March 2005 (E) Rec. H.264 (E) ITU-T Recommendation
- *H.264 Baseline Profile Decoder on DM6467 User's Guide* (literature number SPRUET5)

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
625SD	Level 3.0 Maximum resolution format size 720x576
CIF	Common Intermediate Format
CPB	Coded Picture Buffer
D1	SDTV image resolution (720x480)
QCIF	Quarter Common Intermediate Format
QDMA	Quick Direct Memory Access
SDTV	Standard Definition Television
SEI	Supplemental Enhancement Information
VGA	Video Graphics Array (640x480 resolution)
VUI	Video Usability Information
XDM	eXpressDSP Digital Media

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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