



- Compliant with the eXpressDSP Digital Media (XDM) interface
- Validated on the DM648/TNETV2685 EVM
- Baseline sequential mode for interleaved data formats (single scan) supported
- Multiple scans for planar formats YUV420, YUV411, YUV422, and YUV444 supported
- Arbitrary image size supported
- Maximum of three scans supported
- Comment insertion into the JPEG header supported
- Frame-based mode encoding supported
- Standard JPEG header included and JFIF or EXIF style header not included
- Huffman tables and quantization tables are hard-coded and built into the application at compile-time
- Quantization tables are fixed with a quality factor (0 – 100) adjusting the quantization level

This version of the codec does not support the following features:

- Encoding images with pixel resolution more than 8 bits per pixel not supported
- Thumbnail not supported

description

The JPEG Encoder accepts planar image data in YUV4:2:0, YUV4:1:1, YUV4:2:2, and YUV4:4:4 formats. It accepts interleaved image data in YUV4:2:2 format and accepts grayscale input. This project is developed using Code Composer Studio 3.3 and using the code generation tools version 6.0.8.



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summary of performance

Table 1. Configuration Table

CONFIGURATION	ID
Normal configuration (4:2:2 interleaved input and 4:2:2 output)	JPEG_ENC_001

This configuration of JPEG Encoder does not require DMA resource. Default cache configuration (L1D cache: 32K-bytes, L1P cache: 32K-bytes, L2 cache: 128K-bytes).

Table 2. Cycles Information – Profiled on DM648/TNETV2685 with Code Generation Tools Version 6.0.8

CONFIGURATION ID	PERFORMANCE STATISTICS (IN MEGA PIXELS PER SEC) ¹		
	TEST DESCRIPTION	AVERAGE ²	PEAK ³
JPEG_ENC_001	Measured on input file, Input_422.yuv with frame size 768 x 512 at 10:1 compression ratio	40	None

¹ Measured with program memory, stack, and I/O buffers in external memory

² Measured for DM648/TNETV2685 at 594 MHz

³ Peak value is not calculated for this version of JPEG Encoder

Table 3. Memory Statistics - Generated with Code Generation Tools Version 6.0.8

CONFIGURATION ID	MEMORY STATISTICS ⁴				
	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
JPEG_ENC_001	25	0	13.86	8	46.86

⁴ All memory requirements are expressed in kilobytes (1K-bytes = 1024 bytes).

Table 4. Internal Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – INTERNAL ⁵		
	SHARED		INSTANCE ⁶
	CONSTANTS	SCRATCH	
JPEG_ENC_001	0	0	0

⁵ All memory requirements are expressed in kilobytes.

⁶ Does not include I/O buffers

Table 5. External Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – EXTERNAL ⁷		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
JPEG_ENC_001	2.9	6.5	4.46

⁷ All memory requirements are expressed in kilobytes.

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notes

- Total data memory for N non pre-emptive instances = Constants + Scratch + N*(Instance + I/O buffers + Stack)

references

- TMS320 DSP Algorithm Standard Rules and Guidelines (literature number SPRU352)
- JPEG Encoder on C64x+ User Guide (literature number SPRUF70)

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

EXIF	Exchangeable Image File Format
JFIF	Joint File Interchange Format
JPEG	Joint Photographic Experts Group
MHz	MegaHertz
XDAIS	eXpressDSP Algorithm Interface Standard
XDM	eXpressDSP Digital Media

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