



- 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) <sup>1</sup>		
	TEST DESCRIPTION	AVERAGE <sup>2</sup>	PEAK <sup>3</sup>
JPEG_ENC_001	Measured on input file, Input_422.yuv with frame size 768 x 512 at 10:1 compression ratio	40	None

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

<sup>2</sup> Measured for DM648/TNETV2685 at 594 MHz

<sup>3</sup> 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 <sup>4</sup>				
	PROGRAM MEMORY	DATA MEMORY			TOTAL
		INTERNAL	EXTERNAL	STACK	
JPEG_ENC_001	25	0	13.86	8	46.86

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

Table 4. Internal Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – INTERNAL <sup>5</sup>		
	SHARED		INSTANCE <sup>6</sup>
	CONSTANTS	SCRATCH	
JPEG_ENC_001	0	0	0

<sup>5</sup> All memory requirements are expressed in kilobytes.

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

Table 5. External Data Memory Split-up

CONFIGURATION ID	DATA MEMORY – EXTERNAL <sup>7</sup>		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
JPEG_ENC_001	2.9	6.5	4.46

<sup>7</sup> All memory requirements are expressed in kilobytes.

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

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