

## JPEG Encoder (v1.13) on C64x+

### FEATURES

- eXpressDSP Digital Media (XDM) interface compliant
- Validated on the DM644x 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 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
- Thumb nail not supported
- Encoding images with pixel resolution more than 8 bits per pixel not supported

### DESCRIPTION

JPEG Encoder accepts planar image data in YUV 4:2:0, YUV 4:1:1, YUV 4:2:2, and YUV 4:4:4 formats. It accepts interleaved data in YUV 4:2:2 format and accepts grayscale input. JPEG Encoder is developed using Code Composer Studio 3.3.49 and using code generation tools version 6.0.14.

PRODUCT PREVIEW



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## Performance Summary

This section describes performance of the JPEG Encoder.

**Table 1. Configuration Table**

CONFIGURATION	ID
Normal configuration (4:2:2 interleaved input and 4:2:2 output)	JPEG_ENC_001 <sup>(1)</sup>

(1) This configuration of JPEG Encoder does not require DMA resource. Default cache configuration: 32 K-bytes L1D cache, 32 K-bytes L1P cache, and 64 K-bytes L2 cache.

**Table 2. Cycles Information – Profiled on DM6446 EVM with Code Generation Tools Version 6.0.14**

CONFIGURATION ID	PERFORMANCE STATISTICS (MEGA PIXELS PER SECOND) <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	39	None

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

(2) Measured for DM6446 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 6.0.14**

CONFIGURATION ID	MEMORY STATISTICS <sup>(1)</sup>				TOTAL
	PROGRAM MEMORY	DATA MEMORY			
		INTERNAL	EXTERNAL	STACK	
JPEG_ENC_001	25	0	13.86	8	46.86

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

**Table 4. Internal Data Memory Split-Up**

CONFIGURATION ID	DATA MEMORY - INTERNAL <sup>(1)</sup>		
	SHARED		INSTANCE <sup>(2)</sup>
	CONSTANTS	SCRATCH	
JPEG_ENC_001	0	0	0

(1) All memory requirements are expressed in kilobytes.

(2) Does not include I/O buffers.

**Table 5. External Data Memory Split-Up**

CONFIGURATION ID	DATA MEMORY - EXTERNAL <sup>(1)</sup>		
	SHARED		INSTANCE
	CONSTANTS	SCRATCH	
JPEG_ENC_001	2.9	6.5	4.46

(1) 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 SPRUEB1B)

## 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/Abbreviation	Description
EXIF	Exchangeable Image File Format
JFIF	Joint File Interchange Format
JPEG	Joint Photographic Experts Group
MHz	Megahertz
XDM	eXpressDSP Digital Media

## Revision History

This datasheet revision history highlights the technical changes made to the SPRS325A codec specific data manual to make it SPRS325B.

### Revision History of JPEG Encoder on C64x+ (DM644x)

SECTION	ADDITIONS/MODIFICATIONS/DELETIONS
<a href="#">Section 1</a>	Features: <ul style="list-style-type: none"> <li>Removed: <b>eXpressDSP Algorithm Interface (XDAIS) compliant</b></li> </ul>
<a href="#">Table 2</a>	Cycles Information: <ul style="list-style-type: none"> <li>Modified header PERFORMACE STATISTICS (MEGACYCLES PERSECOND) to PERFORMACE STATISTICS (MEGA PIXELS PERSECOND)</li> <li>Modified Code Generation Tools Version from 6.0.05 to 6.0.14</li> <li>(Table foot note) Changed frequency to 594 MHz</li> </ul>
<a href="#">SubSec1 1.5</a>	Acronyms <ul style="list-style-type: none"> <li>Removed <b>XDIAS</b> from Acronyms/Abbreviations</li> </ul>

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